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USDA Reports Systemic Success On Bean Pests

WASHINGTON — Experimental success with two systemic insecticides for use in both granular and liquid forms against bean pests has been reported by the U.S. Department of Agriculture.

Used in these forms, rather than as spray or dust, phorate (Thimet) and Di-Syston—0,0-diethyl S-2 (ethylthio) ethyl phosphorodithioate — controlled the two-spotted spider mite. Control lasted for two to three months in experimental plots of lima beans, according to scientists of USDA's Agricultural Research Service.

Soil applications of systemics are not destructive to natural predators and parasites of crop pests, the scientists said.

The insecticides were applied at planting time through nozzles or tubes attached to the planter boots so as to place the insecticide in the soil with the seed.

In the experiments, conducted in southern California, the systemics applied in the seed furrow in dosages of less than 1 lb. per acre were as effective as higher dosages against the mites. Control was as high as 95% for three months after planting. The residue amounted to less than 0.1 ppm (parts per million) in tested samples of dried beans, and there was no appreciable toxicity to the bean plants.

Applied in granular form at an average of 18 to 20 oz. per acre, the systemics controlled the pest sufficiently during the growing season to maintain normal yields of about 21 sacks (100 lb.) per acre as compared to 15 in untreated plots. Liquid applications at an average of from 24 to 25 oz. of insecticide per acre gave similar results.

Dosages of 2 or 4 lb. of insecticide per acre gave good control of the western flower thrips—a crop pest also present in the experimental plots —but reduced the plant stands. For control of the mite, however, scientists found dosages as small as ½ lb. or less can be used with good results and with little damage to the stand.

Roundtable Hears About Production Processes, Calculating Formulations

By LAWRENCE A. LONG
Editor of Croplife

WASHINGTON—Processes of fertilizer manufacture from raw materials to the bag and the mechanics of calculating plant food formulations were featured in the first sessions of the three-day Fertilizer Industry Round Table meeting at the Mayflower Hotel here Nov. 4. About 500 representatives of the industry were on hand for the conference, a record-breaking attendance, according to Dr. Vincent Sauchelli, chairman.

How a multiple plant operation functions was explained by L. V. Clegg, Canadian Industries, Ltd., who reviewed the organizational setup of his company and set forth the operations of the production departments in each of the firm's seven fertilizer manufacturing plants. He was followed by Elgin Doidge, processing engineer for CIL, who went into detail about the operations of the plants themselves.

Mr. Clegg outlined the duties of the production department in all seven plants and their relationship to the home office. These functions included the ordering and scheduling of raw materials; quality control; formulation control; selection and training of new technical staff members; safety and keeping statistical records.

The speaker showed on a screen some of the forms used by the company in fulfilling these obligations. He noted that such records allowed not only the parent organization to know what is being done at the various plants, but also enables the plants themselves to compare their activities with all the others.

This, Mr. Clegg noted, promotes a healthy spirit of competition and allows each to take stock of how its record compares with the other plants.

Ordering supplies, obviously an important function, is handled on an annual basis. Each plant makes up a list of what materials it expects to require and when each item will be needed. The central organization then handles the actual ordering of such supplies. It is a flexible plan, Mr. Clegg explained, and has worked out very well over a period of years.

The matter of quality control is important to the company. Of the seven manufacturing plants, four have chemical laboratories to check fertilizer output. Formulation control is likewise important. The production engineers aid through personal consultation and through manuals, yet the question remains largely unanswered whether each plant should work on its own formulation problems, Mr. Clegg said.

Selection and training of new members of the technical staff is another important function of the production department. These men need not only broad knowledge training, but also practical on-the-job training to see how they get along in their rather exacting assignments.

Accident frequency rates are watched closely in all CIL plants,

(Turn to ROUNDTABLE, page 8)

All-Out Screwworm Eradication Program In Southwest Area Called Unfeasible

WASHINGTON—An all-out eradication program against the screwworm in the southwestern U.S. and adjacent Mexico does not appear feasible at the present time, and the problem requires further research and field trial, the U.S. Department of Agriculture said.

Lack of natural barriers against the fly in the vast infested areas of the Southwest and Mexico is a key factor in this decision. This was confirmed in a survey recently conducted cooperatively by personnel of USDA's Agricultural Research Service, southwestern states, and the Republic of Mexico. The cooperation between the U.S. and Mexico was agreed to by President Eisenhower and President Adolfo Lopez Mateos at Acapulco, Mexico, last February.

Any joint program by the U.S. and Mexico should be confined to research and field trial on sterile male and other techniques that might be used to fight the screwworm, officials believe.

Ezra Taft Benson, secretary of agriculture, said, "With more knowledge and improvement of techniques or by discovering new approaches, a feasible program for eradication of the screwworm from some areas might be developed, but an experimental program combining research and field trial would be quite costly."

The program method used successfully in the Southeast is the release of vast numbers of sexually sterile screwworm flies to mate with native screwworm flies and produce eggs that do not hatch. The flies are reared in a laboratory and sterilized by exposure to radioactive cobalt.

The recent survey and evaluation of findings brought out the following information bearing upon the feasibility of the program in the Southwest:

Large size of the infested area. The average overwintering area of the screwworm includes about 70,000 sq. miles of Texas, 40,000 sq. miles in California, 34,000 sq. miles in Arizona, and 1,000 sq. miles in New Mexico, plus several hundred thousand square miles in adjacent Mexico. By contrast, the average overwintering area in southeastern U.S. is less than 50,000 sq. miles.

Lack of natural barriers to screwworm spread. Screwworms were re-

(Turn to SCREWWORM, page 5)

Pacific Northwest Group Hears Soil Project Progress Reports

YAKIMA, WASH.—More than 200 representatives of the fertilizer industry were in attendance at the 10th annual convention of the Pacific Northwest Plant Food Assn., held Oct. 14-16 at the Chinook Hotel here.

Ray Whitcomb, Grandview, Wash., outgoing president, greeted delegates and reported on activities of the last year. Henning Waltersdorph, Seattle, treasurer, reported on finances and Leon S. Jackson, Portland, gave the secretary's report.

Grant Braun, American Potash Institute, Portland, reported on the work of the soil improvement committee, which is composed of 19 members from Oregon, Idaho and Washington. The committee carries on an education program limited to the fertilizer industry, which reached 800 dealers last year.

The association also sponsors demonstrations on dairy farms of the Northwest, concentrating on pasture and forage.

Soil testing programs have been sponsored in the three states in cooperation with vocational agricultural school programs. The Washington program is completed, and those in Oregon and Idaho are still in progress.

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1958-59 Potash Production Totals 3.8 Million Tons

WASHINGTON — Production of marketable potassium salts in the U.S. during the 12 month period ending June 30, 1959, amounted to 3.8 million short tons, of which 2.2 million tons of potash was included, said the Bureau of Mines, U.S. Department of the Interior, in a report prepared by Robert Ruhlman and Gertrude E. Tucker, branch of ceramic and fertilizer materials.

On June 30, stocks in producers' hands were 29% less than on Dec. 31, 1958, and were the lowest since 1953.

Imports of potash materials continued to increase and in the year ended June 30, 1959, were equivalent to 14% of domestic production. West Germany, France, Spain and East Germany continued as major suppliers. Potash imports from Canada, the first recorded, totaled more than 700 tons and are expected to increase, the report said.

Brrrrr . . .

Insect Antifreeze Seen as Possible Future Control

ST. PAUL, MINN.—Ever wonder how insects will be controlled a few decades from now?

One way might be to throw their "antifreeze" out of kilter and let winter do the rest.

Whether such a control measure will ever be devised is anybody's guess. But the fact that many insects do contain antifreeze was shown conclusively in recent University of Minnesota research.

A team of biochemists found that carpenter ants and certain wood-boring insects were able to generate glycerol within their bodies whenever temperatures dropped below a certain point.

Glycerol is an alcohol similar to the product used in radiators in winter. It's commonly used by artificial breeding technicians for preserving semen at low temperatures.

The research was done by Fred Smith, biochemist, Douglas Pratt, researcher in botany, and two visiting research scientists — Peter Dubach from Switzerland and C. M. Stewart, Australia.

The scientists became more certain of the role of glycerol in winter-hardiness when they found the wood-boring insect larvae had glycerol in winter, but not in summer.

They backed their evidence up when they checked Minnesota carpenter ants' eggs in winter and found them to contain about 10% glycerol by weight. The same ants taken from Maryland, where it wasn't so cold, contained no glycerol at all.

Then the researchers took the Minnesota ants (which contained glycerol) out of their dormancy by slowly bringing them to room temperature. By the time the ants were active three days later, they contained no glycerol.

Mr. Smith says that, apparently, the glycerol is a "stopping point" in the insect's physiological system. He figures that as enzyme action goes on inside an insect's body in warm weather, certain material changes from one compound into glycerol and immediately changes into other chemical substances. In cold temperatures, though, something must happen to stop the process when the glycerol is formed, and it then accumulates in the body.

Just which insects are able to generate glycerol isn't known at present; it would take extensive testing to find them all, the researchers said.

It's known already that corn borers can produce glycerol, which might explain why the borer can live overwinter in corn stalk residue, even though it's lying on the ground in subzero temperatures.

If they could find some way to stop the glycerol accumulation, scientists would uncover a major anti-insect weapon. Only continued research can tell whether this will be possible.

FORMS CORPORATION

WALDENBURG, ARK.—The United Liquid Fertilizer Corp. of Waldenburg has filed articles of incorporation with Arkansas secretary of state to operate a "fertilizer, insecticide and herbicide business." The firm was authorized 8,000 shares of $25 par value stock and listed $300 as its starting capital. The incorporators were John B. Larkin, O. E. Lee, Jeanne O. Larkin and Maxine Lee, all of Jonesboro, Ark. John B. Larkin was named the firm's agent.

NEW PHOSPHATE WAREHOUSE—Wilson & Geo. Meyer & Co. has opened a new warehouse facility in El Centro, Cal. The structure is situated on West State Street at the Southern Pacific tracks and is owned and operated by Cart's, Inc., an El Centro concern. The Anchor phosphate warehouse receives direct rail shipments of Anchor phosphates from manufacturing plants at Garfield, Utah, and stores them pending local delivery. With its capacity of 600 tons of dry fertilizer, the warehouse is one of the largest facilities of its kind in the Valley area.

Marketing Study Reveals Information On Herbicide Purchases, Applications

ST. LOUIS, MO.—A marketing study on the purchases and applications of herbicides has been completed by the marketing research division of Doane Agricultural Service, Inc.

Data used in the study were obtained from the 2,200 member Doane Countrywide Farm Panel.

The study was designed to reveal changes taking place in the herbicide market. Factors such as the share of the market by brand in dollars and acres, consumer satisfaction with brands used, source of purchase and acreage treated by crop are all studied. Also, special attention is given to an analysis of non-users.

The nature of the herbicide market is shown by a comparison of the 1959 report with farmers' use of herbicides last year.

About 57% of commercial farmers used herbicides of some type in 1959 while only 45% used herbicides in 1958. Moreover a shift in types of herbicides used is also indicated. Of value to marketing executives are comparisons between 1958 and 1959, on the number of acres of the various crops treated with herbicides. There was more cotton, corn, hay, soybeans and rice treated in 1959, but less grain sorghum and small grains. Almost twice as much cotton was treated in 1959 as in 1958.

Corn acreage accounted for more acreage treated than all other crops combined, and the acreage of corn treated with pre-emerge in 1959 was more than twice the acreage similarly treated in 1958.

Investment by commercial farmers in herbicides increased from 66¢ per treated acre in 1958 to almost 81¢ per treated acre in 1959.

Sales of some brands and companies remained constant or even declined, despite the fact that there was an over-all increase in herbicides used in 1959 over 1958. One manufacturer, for example, had a 1.56% share of the total dollars spent by commercial farmers for herbicides in 1958, but received only .53% of the market in 1959. Another manufacturer declined from 1.08% in 1958 to .33% in 1959. Co-op brands accounted for about 9% of the 1959 sales of herbicide chemicals.

Farmers' recognition of the names of the primary herbicide manufacturers ranged from a high of 72% recognition to a low of 5.6%. Of the farmers who didn't use herbicides in 1959, almost 40% thought they should have. On the other hand, almost 71% of the non-users are undecided about next year's use, while 23% said they will use herbicides in 1960.

Approximately 70,000 punch cards were used to analyze results of surveys submitted to the 2,200 panel members. The data has been compiled into seven separate reports, one for each of six geographic regions and a seventh summary report for the total U.S.

Spencer Declares Dividend, Announces New Directors

KANSAS CITY, MO.—The annual meeting of the shareholders of Spencer Chemical Co. was held Oct. 27, and the board of directors declared the usual quarterly dividend of 60¢ per share on the common stock of the company and dividend of $1.05 per share on the preferred stock. Both dividends are payable Dec. 1, 1959, to shareholders of record Nov. 10, 1959.

Kenneth A. Spencer, chairman of the board, announced that Harold H. Spencer, chairman of the board of Pittsburg & Midway Coal Mining Co., and Arthur Mag, secretary of the company and senior partner of the law firm of Stinson, Mag, Thomson, McEvers and Fizzell, both of whom had previously served as directors, were elected to fill new positions resulting from an increase in the number of directors. All other directors and officers were reelected.

Monsanto Wins Explosion Suit

ST. LOUIS — Judgment was entered in U.S. District Court here recently in favor of Monsanto Chemical Co. against the Continental Insurance Co., a New York corporation, in a suit resulting from an explosion April 16, 1957, at Monsanto's plant in Nitro, W.Va.

Parties to the suit had agreed beforehand that damage amounted to $4,432,188. A jury in the court of George H. Moore, federal judge, returned the verdict.

Monsanto filed suit for a declaratory judgment to determine which of two insurance companies should assume liability. The two insurance carriers were Hartford Steam Boiler Inspection & Insurance Co., Hartford, Conn., and Continental. Monsanto had insurance coverage with both insurors but each claimed the other was liable.

The main issue at the trial revolved around the circumstances of the explosion which occurred inside a 1,000 gal. tank being used in the production of an insecticide. The decision depended on a determination of the conditions which prevailed at the time of the explosion. Eight persons were killed in the blast.

DUSTER KILLED

PICACHO, ARIZ.—Leon Mortensen, 27, a crop duster pilot with Lazy Eight Flying Service, Chandler, was killed in the crash of his plane at the Coury Ranch northeast of here Oct. 17.

West Virginia Survey Shows Spittlebug Threat

MORGANTOWN, W. VA.—Cooperating members of the West Virginia Insect Survey and agricultural experiment station entomologists of West Virginia University have released results of a 1959 fall insect survey of spittlebugs. This information indicates just how bad these pests will be next spring, David O. Quinn, extension plant pathologist and entomologist, explained.

Each year, spittlebugs cause considerable losses in hay and forage in West Virginia, Mr. Quinn stated. The familiar mass of foamy white spittle, sometimes incorrectly called "snake spit," is evidence that these pests are present in the fields. When the populations of these pests are high, the harvest may be reduced as much as 25% by the feeding of the pests. Recently, in a report from Indiana, the total state loss for 1959 was estimated at a little more than $12 million.

Fifteen counties in West Virginia were surveyed and from four to 10 fields in each county were visited to check on the populations. Eleven of the 15 counties were found to have high populations of adult spittlebugs, indicating that control measures will be needed next year to reduce losses. The over-all state average population shows that treatment for the control of this pest next spring will be economically feasible, Mr. Quinn pointed out.

Research conducted during the past few years by WVU Agricultural Experiment Station entomologists reveals that the use of granular insecticides will control these pests if applied correctly and at the right time. In some experiments, 97 to 98% control has been achieved.

St. Regis Commences Work on New Plant

NEW YORK — Construction has begun on St. Regis Paper Co.'s new $1½ million bag plant in the Vail Field area of Los Angeles, Cal.

West Coast officials of the paper products firm participated in ground breaking ceremonies at the site recently.

The plant will replace the company's present Los Angeles area bag manufacturing facility with an operation nearly double in size. The new plant will cover about 110,000 sq. ft.

DISTRIBUTOR NAMED

CEDAR RAPIDS, IOWA—Heil Northeast Products Corp., South Burlington, Vt., is a new distributor for Highway Equipment Co., Cedar Rapids. They will handle "New Leader" lime spreaders, combination lime and fertilizer spreaders, widespread lime and fertilizer spreaders and mobile blenders.

Lester Christopher Named To Executive Position

WICHITA, KANSAS — Robert S. Wise Co., Inc., Wichita, announces the appointment of Lester Christopher to the position of vice president in charge of sales.

Lester Christopher

Following service in the armed forces, Mr. Christopher was graduated from Kansas State University in 1952. Since then he has held positions with the U.S. Department of Agriculture, Winru Packaging Co. and Douglas Chemical Co.

Mr. Christopher specialized in grain sanitation in college, including control of insects in stored grain. He has conducted laboratory and field tests on many insects. For about two years he was in charge of a pesticide formulating plant.

An Expert Examines . . .

The Relation of Insecticides To Fish and Wildlife Habitat

By Dr. C. H. Hoffman
Entomology Research Division
Agricultural Research Service
U.S. Department of Agriculture

SINCE BIBLICAL days, insects and other pests have challenged man for supremacy of the earth, and man has had to devise increasingly more effective materials and methods to compete with them. Few laymen appreciate the efforts that must be directed to control hundreds of kinds of serious insect pests so that the citizens of this country may enjoy one of the highest standards of living in the world—an abundance of high-quality food from many plant and animal sources, various fibers for clothing, and timber products for homes and specialized uses.

In recent years insecticides have played a leading role in bringing about better living, through the control of insects that threaten our possessions or transmit debilitating or deadly diseases to man and domestic animals. These advances are now being shared with other countries. They are used to check famine and also suffering from human diseases, especially the dreaded mosquito-borne malaria that the World Health Organization is trying to eradicate on a global basis.

With modern rapid transportation the danger of importing serious new insects into the United States is greater than ever before. We must therefore ever be on guard to keep out foreign pests. Certain accidental introductions of years ago are our most serious problems today, and costly efforts are required for their control or eradication.

Insecticides vs. Wildlife

A number of wildlife enthusiasts and conservationists have become greatly concerned over the increasing use of insecticides because of their hazard to fish and wildlife. They have even questioned the need for insecticides on the assumption that if left alone, nature itself will take care of all insect problems.

This matter of insecticide damage to wildlife is of great importance to all of us and merits continued close examination. I am sure, however, that many of the claims of damage could not be substantiated. Some were based on animal kills in areas that had been sprayed, but there was no definite proof of insecticides being the cause. Others were based on kills in experimental areas purposely treated at dosages greater than those required or recommended for insect control.

Entomologists responsible for insecticide recommendations and users of insecticides are cognizant of the problem and desire to do everything possible to avoid or alleviate any detrimental effects to fish and wildlife. They welcome research to make an objective appraisal of dangers likely to be encountered under actual conditions of use.

However, entomologists, representatives of the agricultural chemical industry, and users of insecticides have been disturbed by the many scare stories that have been released with the hope of arousing the public to stop the general use of insecticides or specific control or eradication programs, including those decreed by the Congress. I doubt that persons making such claims have complete knowledge of the research that precedes most programs and of the many factors considered before new insecticides are recommended for public use or large-scale pest-control programs are undertaken.

The hazard to wildlife is always considered, but owing to insufficient research on the many new insecticides that have followed DDT, not as much information has been available as desired. Because of lack of funds and priority of other assignments, there has been a paucity of research information developed by fish and wildlife specialists on the effects of different insecticides on wildlife. In fact, it has sometimes been necessary for entomologists to make studies of the effects of new insecticides on fish as a safeguard prior to making recommendations for insect control.

It is hoped that this situation will be corrected soon and that additional cooperative studies can be undertaken by entomologists, fishery biologists, and other wildlife specialists to arrive at sound procedures for effective control with a minimum of damage to wildlife.

The DDT Trial

Critics of the use of insecticides, particularly some interested in organic farming and wildlife conservation, have published numerous unfounded scare stories on the dangers of DDT to wildlife. Many of these releases appeared about the time a court case was instituted in 1957 by 14 plaintiffs from Long Island, New York, to restrain the Secretary of Agriculture and the New York State Commissioner of Agriculture and Markets from trespassing upon their lands by means of low-flying planes dispersing DDT for the control of the gypsy moth.

Although the intent was to stop the program then under way and to prevent future aerial spraying of their lands, the trial was far broader in scope as indicated in the voluminous testimony. In the trial, which lasted approximately a month, about 50 witnesses gave testimony on the effects of DDT on human health, fish, wildlife, bees, biological control agents, plants, and soil. In this over-all decision in favor of the governmental agencies conducting the program, Judge Bruchhausen had this to say about the effects of DDT on fish and wildlife:

"The plaintiffs have not sustained their claim that spraying causes any considerable loss of birds, fish, bees and insects. Only a few fish and birds were killed in the subject area. Furthermore, evidence of spraying programs throughout the country demonstrates that the fish, bird and bee loss has been inconsequential.

"While there is no evidence of damage to bees and aquatic insects in the subject area, experts and others from various sections of the country established that the defections are made up by repopulation in a short space of time."

These comments are not surprising in view of the extensive studies that had been conducted by the former Bureau of Entomology and Plant Quarantine of the USDA in cooperation with the U.S. Fish and Wildlife Service and other agencies. When there is a controversial subject before the public some newsmen and popular writers make little effort to obtain research background information even though there may be a considerable volume available.

It was perfectly obvious that many of the critics of the use of DDT either were not familiar with the vast amount of research that had been reported on this subject or else they chose to distort the facts in order to arouse the public. The public should be fully advised on all aspects of each large-scale insect-control program, and it is certainly unfortunate when writers do not present all available facts.

Of course, there is always access to the courts, but this is a costly procedure, including the time required by experts to prepare testimony and attend a long trial while their regular work is held in abeyance. A vast amount of research could have been undertaken to develop new ways to control insects and to study the relationship of insecticides to wildlife for the amount of time and money that was spent on the DDT trial in New York.

Value of Spray Programs

In general, the greatest hazard to wildlife from the use of insecticides involves widespread application in areas of high wildlife concentration. There is a definite relationship between wildlife abundance and good habitats. Insects and diseases compete with wildlife in the same habitats. A decision as to whether or not to spray should be based on a fair appraisal of all interests.

For example, the dreaded Dutch elm disease fungus is killing thousands of beautiful and highly valued elm trees in many parts of this country. The disease is transmitted by bark beetles, which can be controlled with properly timed DDT sprays. Recently there has been criticism of this spraying because of accumulation of the DDT in the fallen elm leaves and soil consumed by earthworms which in turn are fed upon by robins and some mortality may result.

This mortality is regrettable, but until better control measures are devised, it must be weighed against the value of the trees or even preservation of the bird habitat that will be lost as a result of the death of the trees. The loss in real estate values and the high cost of removal of dead trees must also be considered. Under these circumstances it is understandable that many cities are continuing with a regular elm spray program.

There has been a prediction that this and other spray programs will doom the robin and other birds. I believe this is an unduly pessimistic assertion. In view of the total area involved in these spray programs in relation to the total area inhabited by birds, it is inconceivable that such operations can produce this effect. The reproductive capacity of birds and their ability to inhabit new locations and to become re-established in sprayed areas should also minimize over-all and lasting effects.

An important haven for wildlife is the forest, where millions of citizens each year benefit from camping, scenic tours, observing wildlife, hunting game, and fishing. These important values must be preserved. However, when the forest is threatened by an insect epidemic, and chemical control is indicated, there may be conflicts regarding the relative importance of the multiple uses.

Forest insects threaten the existence of lumber and wood products industries; the availability of water required for irrigation, power, industrial and domestic uses; and also esthetic and recreational values. Several insect species are capable of destroying millions of acres during the course of an epidemic, and such areas are more susceptible to fire with attendant losses of timber, tree reproduction, wildlife habitat, fish and wildlife. These are the values that must be considered versus temporary and minor losses of fish and wildlife and their food supply as a result of aerial spraying with insecticides.

We recognize that in research, emphasis should be on chemicals that are effective against these insects but innoxious to higher animals. However, until these objectives are achieved there is no alternative to weighing one value against the other where there is conflict of interests.

Measures Used

When an insect new to an area threatens our crops, an early determination should be made whether or not an attempt will be made to eradicate, control, or live with it. Some dangerous insects that could have been eradicated at small cost when first discovered later have proved costly to control or to live with. The idea held

(Turn to FISH, WILDLIFE, page 19)

Presented at the 26th annual meeting of National Agricultural Chemicals Assn., French Lick, Ind., Oct. 21, 1959.

NAC OFFICIALS—New officers elected at the 26th annual meeting of the National Agricultural Chemicals Assn. in French Lick, Ind., Oct. 23, were (left photo, left to right) Jack V. Vernon, president, and Dr. George R. Ferguson, vice president. Mr. Vernon is vice president of Food Machinery & Chemical Corp., New York, and Dr. Ferguson is president of Geigy Agricultural Chemicals, Division of Geigy Chemical Corp., Yonkers, N.Y. The photo at right shows new NAC directors. They are (left to right): Paul Mayfield, vice president, Hercules Powder Co., Wilmington, Del.; John A. Field, vice president—marketing, Union Carbide Chemicals Co., New York, and Herbert F. Tomasek, president, Chemagro Corp., Kansas City, Mo.

Stauffer Directors Appoint Officers

NEW YORK — The directors of Stauffer Chemical Co. elected August Kochs as vice chairman of the board of directors and Rothe Weigel a senior vice president of the company and president and general manager of the Victor Chemical Works Division. Prior to the merger of Victor Chemical Works into Stauffer Chemical Co. on Nov. 1, Mr. Kochs was chairman of the board and Mr. Weigel, president of Victor.

The directors also elected a number of other new company and divisional officers. Their names and titles are:

Raymond L. Geiler, vice president and general manager, A. R. Maas Chemical Division; Morris R. Stanley, vice president, sales, Victor Chemical Works Division; Francis M. Anable, vice president, production, Victor Chemical Works Division; Donald G. Brower, assistant vice president, research, Victor Chemical Works Division; Sam S. Emison, vice president, marketing; Hermann P. Jockers, vice president, production; Roger W. Gunder, vice president, sales, Industrial Chemicals Division; William Engs, vice president, production, Industrial Chemicals Division; Donald G. Ellis, vice president, western sales; James W. Kettle, vice president, finance; Lloyd F. Cummings, assistant vice president, finance; Tolman G. Everett, treasurer; Richard N. Stillman, controller; Arthur H. Swanson, assistant treasurer, director, credit and insurance; Frank A. Schwerdt, assistant treasurer; Herbert A. Flodin, assistant controller; Fred W. Hansen, assistant secretary.

Of the new appointments listed above, Mr. Geiler, Mr. Stanley, Mr. Anable, Mr. Brower, Mr. Everett, Mr. Schwerdt, Mr. Flodin and Mr. Hansen were formerly officials of Victor.

Mysterious Disease Damages Texas Cotton

LUBBOCK, TEXAS—A mysterious blight or disease of some kind caused spotted damage to cotton in the High Plains area. Thus far the Lubbock Experiment Station personnel have not been able to determine the cause. The cotton in numerous small areas does not mature, and yet there has been no evidence of any disease or blight organisms found in these spots.

Some experts think it may be a combination of factors which take advantage of a temporary lack of moisture in the soil. Most of the cotton in these areas was first affected in late summer and stalks died between then and frost.

The condition is not the same as verticillium wilt or angular leaf spot, though it was just as severe in the affected areas.

New Packaging Company Formed in Delaware

WILMINGTON, DEL.—Packaging Services, Inc., a newly-formed corporation, has opened a fully-equipped plant and offices in the Dravo Shipyard at the foot of Madison Street in this city.

The company is engaged in contract packaging, providing flexible film packaging for products in the chemical, pharmaceutical, food, agricultural chemicals, cosmetics and hardware industries.

The firm is headed by A. J. Gordon, formerly of Gordon Chemicals, of Wilmington, Del., and A. A. Jacobs, of Glenolden, Pa., designer of packaging machinery.

DUSTER INJURED

MESA, ARIZ.—David Elfstrom, 44, of Salem, Ore., crop duster pilot flying for Lazy Eight Flying Service of Chandler, was injured in a crash Oct. 27, and admitted to Mesa Southside District Hospital with burns on both arms and hands.

150 Attend Michigan Pesticide Conference

EAST LANSING, MICH. — Some 150 persons were on hand to attend the Michigan Agricultural Pesticide Conference Nov. 3-4 at Kellogg Center on the Michigan State University campus here. Workers at the college reported on various tests made during the current season for control of fruit insects, fruit and vegetable diseases and weed control.

A panel on problems and outlook for the small package industry was conducted on Nov. 4 under the chairmanship of Al Dowdy, MSU staff.

PLANT PATHOLOGIST

UNIVERSITY PARK, N.M.—Dr. C. J. Mankin has been appointed plant pathologist with the U.S. Department of Agriculture's Agricultural Research Service at New Mexico State University.

Talks on Face Flies Scheduled for School

URBANA, ILL.—Custom spray applicators, as well as farmers, will hear about new developments in controlling "face flies" at the annual Illinois Custom Spray Operators' Training School Jan. 27-28, at the University of Illinois.

In announcing the dates, H. B. Petty, extension entomologist, University of Illinois, pointed out that face flies first attacked Illinois cattle this past summer. At the time, few control measures were known. Research, however, is currently in progress to find more effective control. Results will be reported at the school, according to Mr. Petty.

Some other topics at the school will include new developments in ear worm control, soil insecticides, turf diseases and lawn weeds, granular versus liquid herbicides and the relation between weeds and crop yields.

Executive Vice President

DENVER, COLO.—Frank S. Bosley, 65, vice president in charge of manufacturing and engineering of the Gates Rubber Co., was named executive vice president in charge of manufacturing. The announcement of the creation of the second executive vice presidency of the Gates company was made by Charles C. Gates, Sr., company president.

BULK FERTILIZER PLANT

MARSING, IDAHO—A new bulk fertilizer plant to hold 500 tons of fertilizer for area farmers will soon be put into operation here, according to Ralph Bowman, manager and partner of the Henry Ankeny plant. The firm has been in operation for almost 10 years in the area. The new building is part of expanded company operations here into a block-long warehouse-office and plant operation, Mr. Bowman said. The structure has some 3,800 sq. ft. of indoor space.

Take those big preseason savings on LION® E-2 now!

It's the one and only ammonium nitrate you can safely store for big spring markup and extra profit! Lion E-2 is free-flowing when you get it... free-flowing when you sell it... no matter how long you store it!

NO CAKING... GUARANTEED. Lion E-2 prills won't break down, crumble or cake under the heavy weight of stacking in shipment or storage. E-2 is free of dust and fines ... not affected by extreme temperature changes or humidity. You and your customers can buy now, store safely until used. Guaranteed storage-stable.

TAKES LESS STORAGE SPACE. Lion E-2 has the greatest density of any ammonium nitrate on the market. It's less bulky ... takes 20% to 25% less storage space. It saves you needed floor area. It isn't necessary to spread out E-2 in smaller stacks like old style forms of ammonium nitrate. With E-2 you stack higher utilizing all available storage area, without fear of caking.

EASY-TO-HANDLE BAGS. Lion E-2 multiwall bags are specially coated with Monsanto Syton®—the antislip agent that lets you stack Lion E-2 higher ... move it faster ... handle it easier.. It helps you save time, work and space ... reduces material losses through breakage due to slippage.

NEW LION E-2

Always stores...

Always pours

MONSANTO CHEMICAL CO
Inorganic Chemicals Division
St. Louis 66, Missouri

Monsanto

SCREWWORM

(Continued from page 1)

ported at elevations of 8,000 ft. in Mexico and 6,000 ft. in the U.S.—suggesting that existing mountain ranges do not provide natural barriers to the movement of this pest. Numerous valleys through the mountain ranges form corridors that facilitate migration. This contrasts with the situation in the Southeast where the ocean and gulf are extensive fly-free boundaries of the eradication area, providing an effective natural barrier against reinfestation.

Long-range aspects of a screwworm program. Efforts to protect the U.S. and adjacent areas of Mexico from infestation from farther south would necessitate establishing some type of permanent buffer zone. On the basis of present knowledge, it appears that sterile flies would have to be continually reared and released in this zone along with appropriate inspections and control of livestock movements.

Screwworm infestations. The survey data showed that the majority of screwworm cases in the Southwest and Mexico occurred in navels of newborn animals and in man-made wounds, such as castration, dehorning, shear cuts, branding, and earmarking. Excessively dry and excessively wet climates limit buildup of infestations.

Status of work in southeastern states. Due to satisfactory progress in eradicating the screwworm in the Southeast, Nov. 14 has been set as the data for closing the facilities located at Sebring, Fla., for production of flies used in the program. Dispersal of sterile flies will be discontinued by that time, also. The building and equipment will be maintained on a standby basis but all flies used as breeding stock will be destroyed. If it is necessary to resume operations in the Southeast, stock for a new fly colony can be obtained from a USDA research laboratory at Kerrville, Texas.

Arizona Firm Files Incorporation Articles

PHOENIX, ARIZ.—Articles of incorporation have been filed for Tri-state Enterprises, to be established "in Maricopa County" listing $1,000,000 capitalization, to engage in the business of buying, selling and dealing in chemicals, fertilizers, insecticides, farm supplies and goods.

First officers shall be Joseph S. Jenckes, Jr., Phoenix, president; James M. Bush, Phoenix, vice president, and James Powers, Phoenix, secretary-treasurer.

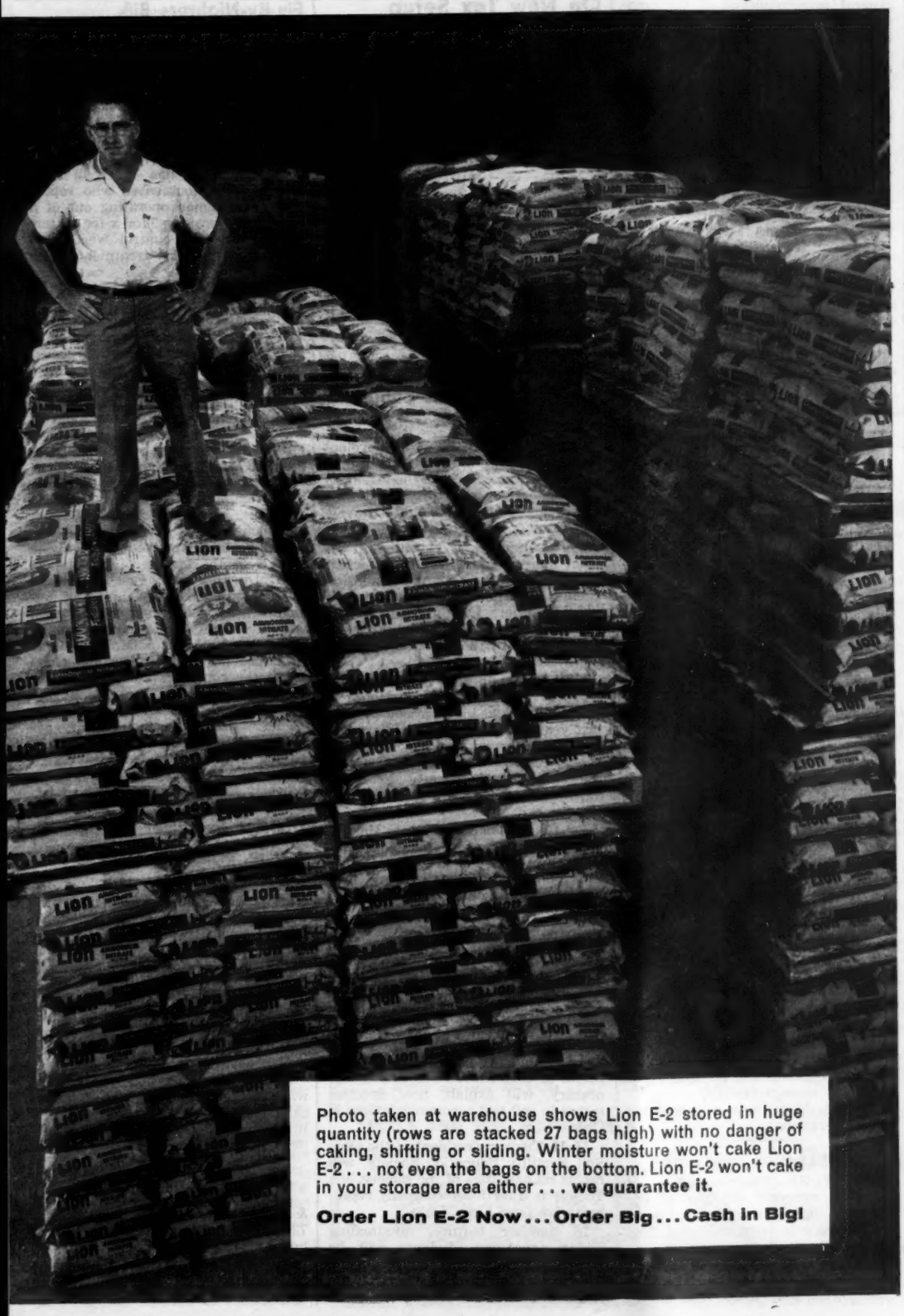


Photo taken at warehouse shows Lion E-2 stored in huge quantity (rows are stacked 27 bags high) with no danger of caking, shifting or sliding. Winter moisture won't cake Lion E-2 . . . not even the bags on the bottom. Lion E-2 won't cake in your storage area either . . . **we guarantee it.**

Order Lion E-2 Now . . . Order Big . . . Cash in Big!

Farm Equipment Must Be Cleaned, County Told

PLAINVIEW, TEXAS — The Hale County Noxious Weed Control District has taken advantage of a state law to compel all owners of harvesting equipment to clean their machines of noxious weed seed before entering Hale County or from moving from one location to another within the county.

District officials are also urging farmers to take precautions to keep bindweed, Johnson grass and other field pests from spreading. The best way to clean machinery, say the officials, is to wash the interior and exterior with water under pressure.

The last few years have proved that eradication with chemicals is quite expensive. Though thousands of dollars have been spent on such chemicals with good results, these dollars will have been wasted if farmers carelessly allow new weed infestations to develop, said Archie G. Martin, supervisor of the Hale County Noxious Weed Control District.

Corn Borers Increase 100% in Wisconsin

MADISON, WIS. — The European corn borer population in Wisconsin this year is about 100% greater than it was in 1958, according to the State Department of Agriculture.

However, the department said that the total number of borers in the state is still considerably lower than that of many other midwest states.

E. L. Chambers, chief of the department's plant industry division, said it was impossible to predict the 1960 borer population.

Fertilizer Short Course Announced for Delaware

NEWARK, DEL.—A fertilizer short course day has been scheduled for Nov. 24, at the Capital Grange Hall, Dover, Del., as part of the Delaware Crop Improvement Assn. crops show and short course.

Fertilizer specialists from Tennessee, North Carolina, Virginia, Maryland and Washington, D.C., will appear on the program.

Topics will be of interest to fertilizer dealers and handlers, as well as farmers, said Cashar Evans, president of the association.

Retired Miller Publishing Executive Dies in East

NEW YORK—Wayne G. Martin, Jr., retired vice president and eastern states manager of The Miller Publishing Co., died at Greenwich, Conn. Nov. 2 at the age of 61. Mr. Martin retired because of ill health in 1954, the year the publishing firm started Croplife.

$5,000 Allocated

LUBBOCK, TEXAS—A $5,000 allotment for fertilization studies has been allocated by the Plains Cotton Growers Assn. for their 1960 budget. This organization includes leading farmers in this cotton-growing area, and has been doing much work in solving the problems that farmers face.

Fertilizers are being used more each year, but there has not been enough research yet to determine just how much is needed on each soil type, the association said. Included in the budget are also large sums for cotton breeding, water conservation studies and for other phases of cotton growing and marketing.

New Sales Office

NEW ORLEANS, LA.—West Virginia Pulp & Paper Co. has created a new sales office to be known as the Middle Atlantic sales district, announced Jason M. Elsas, regional manager, multiwall bag division.

The new sales office will cover the states of Maryland, Virginia, North Carolina and South Carolina.

Armour Agricultural Chemical Announces Major Changes in Organizational Setup

H. V. Miller

R. L. James

B. M. Machen

J. E. Moore

ATLANTA, GA.—A major organizational realignment of the Armour Agricultural Chemical Co. has been announced by W. E. Shelburne, of Atlanta, president of the firm.

W. E. Shelburne

Four top executive appointments were also announced by Mr. Shelburne.

The Atlanta-headquartered company is being organized into two major divisions—fertilizer and nitrogen-phosphate, Mr. Shelburne explained.

The fertilizer division will include Armour's 27 complete fertilizer manufacturing plants in the U.S. as well as one in Cuba and one in Puerto Rico, the announcement said.

The nitrogen-phosphate division will include Armour's newly-acquired nitrogen plant in Crystal City, Mo., and phosphate mining and processing facilities in Bartow, Fla., and Columbia, Tenn., and a triple-superphosphate manufacturing plant at Bartow.

Company executives appointed to newly-created positions under the new organizational structure are: H. Vise Miller, of Atlanta, named vice president and general manager of the fertilizer division; Robert L. James, of Atlanta, vice president and general manager of the nitrogen-phosphate division; Bernard M. Machen, of Crystal City, sales manager of the nitrogen division, and John E. Moore, of Atlanta, assistant to the president.

The appointments are effective immediately, Mr. Shelburne said.

Armour Agricultural Chemical Co., formerly known as Armour Fertilizer Works, is a division of Armour & Co., Chicago.

Mr. Miller, who has previously been vice president and general sales manager of the fertilizer company, is also an assistant vice president of Armour & Co. He joined the Armour organization in 1923. He later was named assistant manager of the company's Nashville division and from 1944 to 1953 served as manager to the Houston, Texas, division. He came to the Atlanta general offices of the company in 1953 as area sales manager—a title he held until appointed vice president and general sales manager in 1955.

Mr. James, new vice president and general manager of the nitrogen-phosphate division, formerly was a senior staff associate in market research and project feasibility for Arthur D. Little, Inc., research firm of Cambridge, Mass. Prior to joining Arthur D. Little, Mr. James was associated with the Cities Service Research & Development Co., New York, Publicker Industries, Inc., Philadelphia, Pa., and Allegheny Ballistics Laboratory, Cumberland, Md. He is a graduate in chemical engineering from Oklahoma State University and has done graduate work at the University of Minnesota.

Mr. Machen, who will be located at Armour's nitrogen plant offices in Crystal City, Mo., has had a long career selling agricultural chemicals. He is a native of Alabama, and attended Howard College in Birmingham, Ala., and Alabama Polytechnic Institute at Auburn, before joining Allied Chemical & Dye Corp., in 1939. He served in several sales executive capacities with leading companies until joining the Mississippi River Chemical Co., as assistant sales manager in 1958. He joined Armour when the Mississippi River Chemical Co.'s nitrogen plant at Crystal City was purchased by Armour earlier this year.

Mr. Moore has served as assistant general superintendent of the company prior to being named assistant to the president. A 1939 graduate in chemistry from Mississippi State College, he joined Armour at its New Orleans, La., plant in 1939. He was promoted to assistant superintendent of that plant in 1944, and in 1946 was named plant superintendent in Dallas. Mr. Moore came to Atlanta later that year as the company's chief chemist.

Oregon Weed Conference Program Plans Told

MEDFORD, ORE.—The Oregon Weed Conference here Nov. 12-13 will offer air and ground agricultural sprayers and dusters the only "refresher" opportunity between now and 1961, said Ray Kelso, herbicide control supervisor with the Oregon Department of Agriculture.

Mr. Kelso said that the applicators' short course, staged annually since 1951 by the state college and the department, was recently cancelled for 1960.

Of interest to ground applicators will be a discussion on the most effective use of soil sterilants by Dr. Dave Bayer, Davis, Cal., University of California extension weed specialist.

New developments in farm chemicals research, presented by Dr. Virgil Freed of Oregon State College and a talk on weed control and plantings on Oregon highways by Mark H. Astrup of the state highway department are also on the program, Mr. Kelso said.

George Moose of the Oregon Department of Agriculture will discuss ragweed controls and present slides to familiarize those attending with this public nuisance.

Other features of the two day program include a discussion of new chemicals which have a place in weed control by three chemical company representatives.

Ohio Site Chosen For Fertilizer Plant

NEW BREMEN, OHIO—The G. B. C. Chemical Co. has selected three acres directly north of New Bremen as the site for its new chemical fertilizer plant.

Several months ago the firm began work on a 112 ft. by 140 ft. building which will be used for storing, mixing and bagging fertilizer. A 24 ft. by 42 ft. building will be used as an office and storage facility.

Frank L. Miller is in charge of the firm's operations.

PROCEEDINGS PUBLISHED

NEW YORK—The proceedings of the 45th mid-year meeting of the Chemical Specialties Manufacturers Assn. have now been published. The 204-page book contains all papers, discussions and committee reports presented at the meeting, held in Chicago, Ill., May 18-20, 1959.

15 STATES AFFECTED

WASHINGTON—The face fly, known in only three states before 1959, has spread to 12 other states and in at least three of these has become an annoying pest of livestock, the U.S. Department of Agriculture reported.

The pest, known scientifically as Musca autumnalis, was found for the first time this past summer in 12 northeastern and north central states. It was reported most troublesome and abundant in Ohio, Indiana and Illinois, according to entomologists of USDA's Agricultural Research Service.

The nine other states in which the fly was found last summer for the first time were: Wisconsin, Michigan, Delaware, Massachusetts, New Hampshire, New Jersey, Pennsylvania, Vermont and West Virginia.

Cooperative Votes On New Tax Setup

FRESNO, CAL.—At a special meeting of the board of directors of Valley Nitrogen Producers, Inc., held on Oct. 22, the board elected to be treated as a tax-paying cooperative, although under the provisions of Section 521 of the Federal Internal Revenue Code of 1954, Valley Nitrogen Producers, a fully farmer-owned cooperative, was entitled to claim exemption from federal income taxation.

The firm has ammonia, ammonium sulphate and sulfuric acid plants now operating.

Ammonium phosphate and phosphoric acid plants are under construction and are scheduled to be in operation this year.

Fertilizer, Lime Use On Ohio Farms Is Subject Of Dec. 11 Conference

COLUMBUS, OHIO—New developments in the use of fertilizer and lime on Ohio farms will claim the attention of speakers at a fertilizer and lime conference on the Ohio State University campus Dec. 11.

The conference is expected to attract lime and fertilizer manufacturers and dealers, county extension agents, vocational agriculture teachers and others from throughout the state. Sessions will be in the conference theater of the Ohio Union starting at 9 a.m.

Those attending the event will hear a report on a fertility promotion program conducted in Guernsey County last year. Discussing this subject will be H. E. Shoemaker, Ohio State University extension agronomist; Oscar Share, Guernsey County extension agent, and other county representatives.

Dr. George Gist, Ohio State University Extension agronomist, will team up with a county agent and a farmer to explain how a fertilizer and lime program works on an Ohio farm. Another Ohio extension agronomist, Dr. Gordon Ryder, and Norman Arnold, Miami County extension agent, will discuss Miami County's fertilizer demonstration program.

Dr. J. Benton Jones of the Ohio Agricultural Experiment Station will talk on "Technical Aspects of Soil Fertility Correlation Work on Ohio Farms," and Dr. O. L. Musgrave, director of Ohio State's soil testing laboratory, will explain new developments in soil test recommendations in Ohio.

H. H. Tucker, president of the Ohio Soil Fertility Education Society, will report on activities of the society. Mr. Tucker is a fertilizer company representative from Lima, Ohio.

In another feature, outstanding senior agronomy students will be awarded scholarships by the Ohio Processed Limestone Assn. and the National Plant Food Institute.

Grace Opens New St. Louis Sales Office

MEMPHIS, TENN.—Creation of a new sales district has been announced by W. R. Grace & Co., Grace Chemical Division, Memphis.

Office of the new sales district is at 8230 Forsyth Ave., St. Louis 24, Mo. The new office is headed by Robert L. Tilton as district sales manager and will cover Kansas, Missouri, Kentucky and the southern half of Illinois and Indiana. Mr. Tilton is assisted by J. D. Leeke.

In addition to serving present customers of Grace within the district, new distributorships will be established for anhydrous ammonia, Grace Urea Prills and for Grace Micro-Prilled Urea Feed Compound.

Mr. Tilton, for the last three years, was in the furniture business. Prior to that he was with Olin Mathieson in anhydrous ammonia sales and in the development of new ammonia distributors in the middle west.

Fly-By-Nighters Bilk California Home Owners

SAN FRANCISCO, CAL. — Home owners should be on guard against some house-to-house peddlers of lawn treatments, according to the California Department of Agriculture.

Robert Z. Rollins, chief of the department's Bureau of Chemistry, says his office has received complaints from housewives who report that several men operating out of a truck have promised for a fee to fertilize lawns and control weeds and grubs in them by treatment with chemicals.

According to reports received by Mr. Rollins, the men have applied some material and disappeared. In some cases the weeds have remained heavy as ever and, in other cases, large parts of lawns have been killed.

Mr. Rollins said that generally the housewife is unable to remember the license number of the truck and in the rare case when the men have left an address on a receipt for payment, it has been found to be fictitious. The crew of men usually operate for only a few days in one city and then move on to another, so it is difficult to apprehend them.

Mr. Rollins explained that anyone who is in the business of such pest control in this state must be licensed by the California Department of Agriculture, and also must be registered with the county agricultural commissioner. He said a number of reliable firms provide such services, but nearly all the complaints come from the work of unlicensed fly-by-night operators. He recommended that householders check with their county agricultural commissioner before engaging services of lawn sprayers to make sure they are dealing with a properly licensed established firm.

District Fertilizer Schools Set in Wisconsin

MADISON, WIS.—A series of district fertilizer dealers and lime producers schools have been scheduled by the soils department of the University of Wisconsin, according to C. J. Chapman, extension soils specialist.

The meetings will be held as follows: Dec. 8, Beaumont Hotel, Green Bay, Wis.; Dec. 9, Eau Claire Hotel, Eau Claire, Wis., and Dec. 10, Wisconsin Center Building, Madison.

At all of the meetings, proceedings will start at 9:30 a.m., Mr. Chapman said, and representatives of the fertilizer industry are expected to participate.

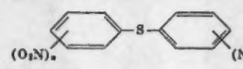
FERTILIZER WAREHOUSE

STANLEY, IOWA—Kaufman Feed & Grain Co. here is constructing a 72 ft. by 32 ft. bulk fertilizer warehouse. The warehouse is the first step in a projected $25,000 modernization and expansion program. Glen and Jim Kaufman are partners in the firm.

PATENTS and TRADEMARKS

2,909,457

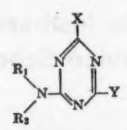
Nematocide Control. Patent issued Oct. 20, 1959, to Gail H. Birum, Dayton, Ohio, assignor to Monsanto Chemical Co., St. Louis, Mo. The method of treating nematode-infested soil which comprises dispersing in the soil a toxic quantity of a compound having the structural formula



in which n is an integer of from 1 to 2.

2,909,419

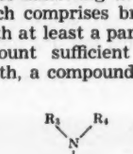
Compositions and Methods for Influencing the Growth of Plants. Patent issued Oct. 20, 1959, to Hans Gysin, Basel, and Enrico Knusli, Riehen, near Basel, Switzerland, assignors to J. R. Geigy A.-G., Basel. A method of inhibiting the growth of plants which comprises bringing into contact with at least a part of a plant in an amount sufficient to inhibit plant growth, a compound of the formula:



wherein R_1 and R_3 each represents a member selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, lower hydroxyalkyl, and cyclohexyl radicals and R_1 and R_2 together with the corresponding nitrogen atom constitutes five to six-membered alkylenimino radicals and the morpholino radical, and X and Y each represents a member selected from the group consisting of chlorine, lower alkoxy, lower alkylmercapto, lower alkenyloxy, lower alkenylmercapto, lower nitroalkoxy, lower chloroalkoxy, lower alkoxyalkoxy and lower hydroxyalkoxy radicals.

2,909,420

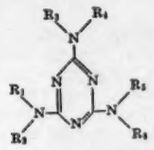
Compositions and Methods for Influencing the Growth of Plants. Patent issued Oct. 20, 1959, to Hans Gysin, Basel, and Enrico Knusli, Riehen, near Basel, Switzerland, assignors to J. R. Geigy A.-G., Basel. A method of inhibiting the growth of plants which comprises bringing into contact with at least a part of a plant in an amount sufficient to inhibit plant growth, a compound of the formula:



wherein X represents a member selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, lower alkylmercapto, lower alkenyloxy, lower alkenylmercapto, lower nitroalkoxy, lower chloroalkoxy, lower alkoxyalkoxy, lower hydroxyalkoxy radicals, and R_1, R_2, R_3 and R_4 each represents a member selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, lower hydroxyalkyl, and cyclohexyl radicals, and each of the pairs of radicals R_1 and R_2, and R_3 and R_4 together with the corresponding nitrogen atom constitutes a member selected from the group consisting of five to six-membered alkylenimino radicals and the morpholino radical.

2,909,421

Compositions and Methods for Influencing the Growth of Plants. Patent issued Oct. 20, 1959, to Hans Gysin, Basel, and Enrico Knusli, Riehen, near Basel, Switzerland, assignors to J. R. Geigy A.-G., Basel. A method of inhibiting the growth of plants which comprises bringing into contact with at least a part of a plant in an amount sufficient to inhibit plant growth, a compound of the formula:



wherein R_1 represents a member selected from the group consisting of lower alkyl, lower alkenyl, hydroxyethyl and cyclohexyl radicals, and R_2, R_3, R_4, R_5 and R_6 each represents a member selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, hydroxyethyl, cyclohexyl radicals, and each of the pairs of radicals R_1 and R_2, R_3 and R_4, and R_5 and R_6 together with the corresponding nitrogen atom constitutes a member selected from the group consisting of five to six-membered alkylenimino radicals and the morpholino radical.

Industry Trade Marks

The following trade marks were published in the Official Gazette of the U.S. Patent Office in compliance with section 12 (a) of the Trademark Act of 1946. Notice of opposition under section 13 may be filed within 30 days of publication in the Gazette. (See Rules 20.1 to 20.5.) As provided by Section 31 of the act, a fee of $25 must accompany each notice of opposition.

BPR, in capital letters, for insecticide concentrate for the manufacture of insecticides. Filed Oct. 15, 1958, by Food Machinery & Chemical Corp., New York. First use July 8, 1957.

Turf-Tone, in capital letters, for fertilizer and plant food. Filed Oct. 23, 1958, by the Espoma Co., Millville, N.J. First use Sept. 2, 1958.

Bulb-Tone, in capital letters, for fertilizer and plant food. Filed Oct. 23, 1958, by the Espoma Co., Millville, N.J. First use Sept. 2, 1958.

Design, drawing of lion's head and word Lion in hand-drawn letters, for fertilizers. Filed March 18, 1959, by Monsanto Chemical Co., St. Louis, Mo. First use October, 1958.

$1.5 Million Loan Agreement Signed

WASHINGTON — Vance Brand, managing director of the Development Loan Fund, announced the signing in Amman, Jordan, of a loan agreement by which the U.S. government will lend $1,500,000 to the Jordan Phosphate Mines Co., Ltd., a private corporation, to help finance expansion of its operations. Approval of this loan on March 20 had been previously announced.

Sheldon T. Mills, U.S. Ambassador, signed the agreement on behalf of the Development Loan Fund. DLF loan officer Hazel K. Shorter was in attendance.

The loan will permit expansion of the output of the company's mines near Ruseifa, northeast of the capital city of Amman, from a present volume of about 320,000 tons of dry phosphate per year, to about 600,000 tons per year in the first phase. Ultimately, if markets, transportation facilities and prices warrant, the company envisages increasing the output at Ruseifa to about 1,050,000 tons a year.

Books on Soils and Soil Management

SOILS AND FERTILIZERS—Fourth Edition

Firman E. Bear

Covers in detail: soil chemicals, important soil elements such as nitrogen, phosphorus, calcium; yield prospects of crop plants, moisture control, soil management; mechanical operations; soil conservation; organic matter maintenance. New facts, accurate figures. 66 illustrations, 420 pages $6.00

SOIL FERTILITY (1955)

C. E. Millar, Professor Emeritus of Soil Science, Michigan State College

A fundamental treatment of the principles of fertility in the soil, with major emphasis on the plant itself. Relevant aspects of soil chemistry, soil physics, soil microbiology and plant physiology from viewpoint of their influence on plant growth. Each major plant food element and the more important micro-nutrients fully treated with respect to supply in the soil, sources and amounts of additions, losses from the soil, functions in plant growth and plant symptoms of deficiency. Covers all sections, with considerable space to saline soils and soils of southern latitudes $6.75

CHEMISTRY OF THE SOIL (1955)

Firman E. Bear

Presents a comprehensive picture of the chemical aspects of soils in relation to their development, present constitution and the uses to which they are put. Covers: chemical composition, soil, colloids, organic matter relationships, oxidation-reduction phenomena, acid, alkaline and saline soils, plant nutrition, nutrient fixation, trace element chemistry, root and soil relationships. Scientists engaged in soil research will find useful data directly applicable to their investigations. Food chemists, manufacturers and those manufacturing liming materials, fertilizers, soil conditioners, surfactants, wetting agents, insecticides, fungicides and other agricultural chemicals will gain new ideas for future product research and development. 384 pages $8.75

SOIL PHYSICS—Third Edition (1956)

Dr. L. D. Baver, Director Experiment Station, Hawaiian Sugar Planters Association

This represents a considerable revision of the earlier versions and incorporates many ideas communicated to the author by soil scientists all over the world. Two new chapters on the principles of soil irrigation and drainage, discussion on soil puddlability, effect of chemical soil conditions on soil structure, and recent contributions of the diffusion process in soil aeration, and information on hydraulic conductivity, soil moisture stress and plant growth, the importance of compaction on soil tillage, and wind erosion processes. 489 pages $7.75

SOILS AND SOIL MANAGEMENT

A. F. Gustafson

A complete study of soils; physical properties, soil, organism, organic matter, relation of water, control of water, tillage, erosion, acidity and its control by liming, management of alkali soils, nitrogen and its importance to the farmer, production, conservation and utilization of farm manures, production and utilization of green manure crops; fertilizer materials and their effects on soils; crop rotations; fertilization and long-term maintenance of productivity of mineral soils. Published 1941. 424 pages, illustrated $6.50

SOIL SCIENCE SIMPLIFIED

Helmut Kohnke

A concise textbook dealing with basic concepts of soils. Much useful information for students in agriculture, farmers, fertilizer salesmen, etc. 68 pages, paper bound $1.00

IRRIGATED SOILS: Their Fertility and Management—New 1954—Second Edition

D. W. Thorne and H. B. Peterson, Department of Agronomy, Utah State Agricultural College. Dr. Thorne is also Chief of Soils and Fertilizer Research Branch, Tennessee Valley Authority

An outstanding text dealing with the problems of irrigated regions. In addition to the chapters dealing with irrigation, the salt problem, reclamation of saline and alkali soils, there are chapters on maintaining organic matter in soil, minerals and plant growth, fertilizer elements and fertilizer materials, using fertilizers, soil management for general field crops, for fruit, vegetable and specialty crops... $7.00

THE RESPONSE OF CROPS AND SOILS TO FERTILIZERS AND MANURES (1954)

W. B. Andrews

A new book, with special reference to Anhydrous Ammonia and other sources of nitrogen in liquid form. Deals also with legumes as a source of soil nitrogen, and the uncertainty of green manures; the response of soil to phosphorus, potash and soda; the effect of fertilizers on yield and feeding value of hay and pasture crops. 468 pages, 19 chapters, 89 illustrations $6.00

CHEMICALS, HUMUS AND THE SOIL

Donald P. Hopkins

The theme of the book is the necessity of chemical fertilizers to maintain the fertility of the soil. It has concise information on which soil conditions and which chemical fertilizers are most suited for special crops and vegetables. Space is devoted to cereal crops, barley, wheat, oats and rye; to roots and tubers, sugar beets, potatoes, carrots, parsnips and turnips; to vegetable crops, beans, peas, alfalfa, lupines; to grasses and clovers; to onions, flax, kale, cabbages, lettuce, tomatoes, celery, cauliflower and fruits. It clarifies the relationship of manures, compost and chemicals as fertilizers and points out how chemicals should be used to obtain the best results. Its philosophical soundness and logic should do much to avert the confusion of thought introduced by the advocates of compost and manure as against the use of chemical fertilizers..... $8.50

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ROUNDTABLE

(Continued from page 1)

Mr. Clegg reported, and plant production people are eager to maintain good records. One reason for this, he said, is a series of prizes offered by the company for plants and departments with the best records. Often a big dinner is given, with local dignitaries at the head table, and prizes are awarded to winning plant teams.

Pictures of winners and of other plant personnel at the dinner appear in local newspapers. Such rewards to plants with outstanding safety records make the program work. One CIL plant went nearly 16 years without a lost time accident, Mr. Clegg reported.

Of all the functions of the production department, that of record keeping is one of the most significant, Mr. Clegg said. Statistics on inventories, comparative figures on the seven plants and forecasts made by production executives all add up to important figures. He said that records show when raw materials were received, the amount of stocks on hand, costs of mixing, sacking and equipment repairs and areas where savings might be made in operational procedures.

Reports are made daily, monthly and annually, giving comparative figures so management as well as the individual plant heads may see how they are doing as compared to last year or several years ago. Trends up or down as well as the popularity of different grades are noted by such records.

Losses in product are also noted, and frequently the reports tell how great such losses are and whether the situation is improving. The production department is responsible for reporting to management and to the accounting department any abnormal shortages in any item. Records of bag weights are important in locating the source of discrepancies, since unusual overweights in many bags can total significant amounts.

Mr. Doidge described in considerable detail the design of the company's plants, three of which were recently constructed at the same time at Chatham, Ingersoll and Hamilton, Ont.

The company set up a pilot plant in 1953 to experiment with the continuous ammoniator and is using that process in its plants now.

With TVA-type ammoniators the production department has solved most of its manufacturing problems, Mr. Doidge said. The dryer used in its present granulation process is 8 ft. in diameter and 60 ft. in length, with a retention time of 28 minutes for the product. It is heated with natural gas at the Chatham plant, but at the Ingersoll and Hamilton sites, oil is used. The unit develops 25 million BTU's of heat for its drying function.

In common with fertilizer plants everywhere, the control of dust and fumes from the facility is a problem. "The location of the plant is an important factor in deciding how much dust and fumes can be tolerated," Mr. Doidge said. In a heavily populated community, naturally it is necessary to keep both to a minimum.

Venturi scrubbers are used to remove fumes from the gas stream, he said. The firm purposely overdesigned its dust control system to assure optimum use. No particular difficulty has been encountered in this area, Mr. Doidge reported.

Four speakers in the afternoon session Nov. 4 discussed the mechanics of formulation calculations. These were W. J. Tucker, GLF Soil-Building Service, Ithaca, N.Y.; J. E. Reynolds, Jr., Davison Chemical Co. division of W. R. Grace & Co., Baltimore; T. R. Schmalz, F. S. Royster Guano Co., Norfolk, and H. H. Tucker, Sohio Chemical Co., Lima, Ohio.

W. J. Tucker, first speaker, set up a hypothetical case in which an operator was to formulate a granular fertilizer of 8-16-16 grade. Three steps would have to be taken, he said.

First, the operator would assess the materials on hand, listing their nutrient analysis and moisture content as indicated by shipper's analysis or by lab analysis. He would also decide upon the ammoniation rates to be used, the overages of plant food to allow, and decide on the end product's moisture content.

The second step would be to set up and solve necessary equations based on known facts, assumptions and the end product requirements desired. The final step, of course, would be to complete, extend and check the formula against the original requirements.

This done, he would proceed with the 8-16-16 problem, deciding on the materials, their nutrient analysis and water content. Nitrogen solution would furnish 44% N and would contain 6% water, for instance. Similar data would be listed on the potash source, phosphate source and phosphoric acid to be used and in the correct amounts consistent with arriving at the correct grade in the end.

Mr. Tucker presented the resulting equation with which the operator would work, and the number of pounds of each ingredient to be used. The total would come to 2,077 lb. which would be reduced to exactly 2,000 lb. when the 77 lb. water was lost in drying.

Mr. Schmalz described methods employed by the Royster firm in formulating granular fertilizer, stating that the procedure eliminates trial and error calculations and accounts precisely for moisture and material losses.

He said the principle is based on the product rather than on the raw materials used. This concept, he said, requires that the raw materials used in manufacturing be handled as they appear in final product. Thus, moisture control in the final product is an important matter, and is handled in the same way as is plant food content analysis.

The moisture in all granular goods is maintained as close to 1% as can be obtained, he explained. "It is a simple matter then to put all the raw materials used on a 1% moisture content basis," Mr. Schmalz said. "This is done by calculating the analysis of the raw materials to a 1% moisture basis and formulating the goods to a 1% moisture content 2,000 lb. ton."

Mr. Schmalz said that to simplify the procedure, tables of analysis for various moisture contents of super, triple and phosphoric acid as well as the solutions, have been prepared for quick reference.

To illustrate his point, Mr. Schmalz reproduced on the blackboard, a complete formula of various materials with their moisture content, process loss factor and final formula figure with these factors taken into consideration.

He told his audience that the method has simplified the mechanics of formulation in his plant and has enabled management to maintain close watch of operations from efficiency and inventory respects.

H. H. Tucker presented the method of triangular diagrams for use in original formulations and calculations and in adjusting formulations.

He reminded that calculations for formulations for nitrogen materials are complicated, since as many as three sources of raw materials may be involved. Other complicating factors include the amounts of free ammonia nitrogen and nitrogen from salts, each of which must be considered separately. "The amount of soluble salts (ammonium nitrate and urea) is important, as is the proportion of urea to ammonium nitrate," Mr. Tucker said.

He listed a few "rules of thumb" as a guide:

1. Ammoniate to the highest possible rate consistent with phosphates used, phophate reversion, nitrogen losses and manufacturing facilities available.
2. Adjust total soluble salts to manufacturing and dry facilities, storage conditions and use of product.
3. Limit amount of urea when used in conjunction with ammonium nitrate.

Triangular diagrams, he said, are an aid in taking the guess work out of formulating, since the cross lines, representing the three nitrogen sources indicate adjustments to be made upon altering any factor.

To illustrate, he marked a point on the diagram and went through the procedure step by step, showing how moving in any direction from a given formulation on the diagram will increase or decrease the amounts of ammonia, soluble salts, urea, water and heat of reaction.

"Evaluation and successful application of the many factors involved is the science and art of fertilizer manufacture," Mr. Tucker said.

Mr. Reynolds gave further points of calculating formulations, using the screen to illustrate the mathematical procedures to arrive at the answers.

An opportunity for those in the audience to ask questions of the speakers evoked a number of queries from the floor.

Al Henderson, Wilson and Toomer Co., Jacksonville, Fla., who had described the operations of his fertilizer plant, was asked additional questions concerning their experience with dust and fume control and his statement that nitrogen losses had been largely overcome in their plant.

Mr. Henderson was asked about the amounts of moisture in finished products. "For 10-10-10, we have about 1½%," he said. "For 4-12-12, it ranges from 3½ to 6%; in 15-0-15, it runs about .75%, and is never allowed to go above 1%." Non-nitrogen grades may range from 3½ to 6%, he reported.

Asked about the capacity of the ammoniator employed at his plant, Mr. Henderson told the round table that its highest rate is about 50 tons an hour of granular 6-12-12, or 40 tons pulverized. He said the ammoniator section is about 12 ft. long, 11 ft. of which is utilized. The spray pipe has 120 holes and is carefully positioned. Nitrogen losses can be corrected by the right position of the sparger and by operating at the proper number of revolutions a minute. The sparger, he said, is 11 ft. in length.

That weather, variable age of materials used and other factors affect calculations of formulae was pointed out by Mr. Henderson in answer to a query. He explained that humidity and temperature have a great influence on formulation results, and thus it may be difficult to calculate every factor over a wide range of conditions.

The final two days of the round table were to be devoted to discussions on conventional fertilizers, semi-granular mixtures, statistical quality control and pre-neutralization.

APPOINTED DIRECTOR

ST. LOUIS, MICH.—Michigan Chemical Corp. has appointed George L. Innes as director of sales and development. Presently manager of the chemical sales and development division of Climax-Molybdenum Co., New York, he will be in complete charge of Michigan's chemical sales and market development activities.

John A. Carpenter

NEW SALESMAN—John A. Carpenter has been named to the sales staff of Southern States Phosphate & Fertilizer Co. He will work directly out of the company's Savannah, Ga., sales office. Mr. Carpenter is a graduate of North Carolina State College, and has a B.S. degree in soils. He was recently associated with the Virginia-Carolina Chemical Co.

Ammonia Institute Sets Service Schools

MEMPHIS, TENN. — The Agricultural Ammonia Institute has announced that a series of ammonia service schools have been scheduled for a number of states for the coming months.

The AAI is cooperating with agricultural colleges and local ammonia associations to sponsor one-day sessions designed to "instruct the people selling and applying ammonia in the latest recommendations, techniques and equipment for good agricultural use of NH_3," said J. D. Aughtry, Grace Chemical Co. agronomist and chairman of the AAI agronomy subcommittee.

Dates and locations have been established for Kansas, Nebraska and Indiana, Mr. Aughtry said, and planning is underway for schools in Arkansas and Texas. (See Meeting Memos, page 23.)

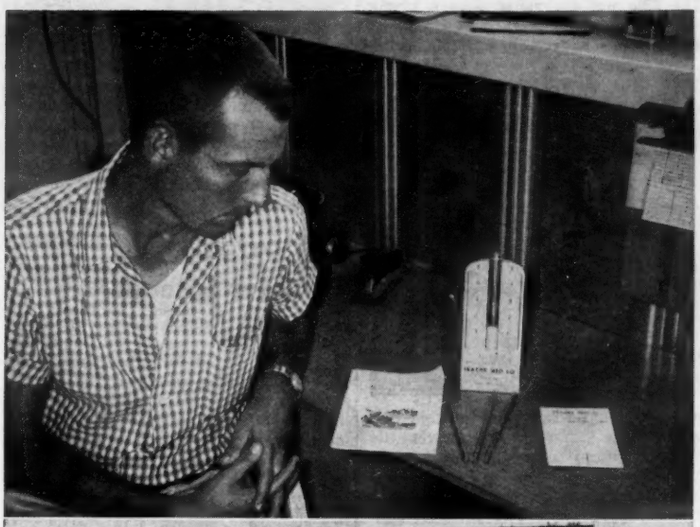
Meanwhile, officials of the AAI and the California Fertilizer Assn. reported that an anhydrous ammonia meeting will be held Feb. 12, at the Hacienda Hotel in Fresno, Cal.

Some of the subjects to be presented at this meeting include:

- Latest developments in ammonia equipment.
- The nitrogen picture.
- Safe practices in handling ammonia.
- Ammonia rates and placement for California crops.
- Ammonia sales and service.
- Nitrogen in a balanced fertility program.
- Discussions on California regulations pertaining to the ammonia industry.

The Illinois Anhydrous Ammonia Assn. has announced its annual fall meeting to be held on the campus of the University of Illinois, Urbana, on Dec. 1-2.

Dr. Roger Bray, Dr. F. Stephenson, University of Illinois soils department; Dr. Hopkins, Dr. B. J. Butler, University of Illinois agricultural engineering department; Dr. E. B. Earley, University of Illinois agronomy department; C. J. Chapman, University of Wisconsin soils department, and Jack F. Criswell, AAI, will appear on the program.



G. E. FRAZIER (top photo), owner of the Frazier Seed & Feed Co., Shaw, Miss., believes giveaways build business. Here are some of the gifts the company utilizes to gain customers. In the bottom photo, the cooperative billboard used by the Trout Feed & Seed Co., Shelby, Miss., is located on the edge of a cotton field near the company.

Two Southern Dealers Solve Small Town Advertising Problem

By EMMETT ROBINSON
and ED WHITE
Croplife Special Writers

Two farm store owners in small towns in the Mississippi Delta area have solved the problem of how to promote business in the absence of local newspapers and radio stations.

Frazier Seed & Feed Co.

In Shaw, Miss., where the Frazier Seed & Feed Co. is located, there is no local newspaper, and advertising in the county seat paper, or over radio stations in surrounding towns, would mean a lot of waste circulation to G. E. Frazier, owner.

So Mr. Frazier turned to the use of advertising for specialty items and to placing ads in specialty publications as a means of attracting customers. One of the most popular giveaway items is a rain gauge with space for the name of the store and the line of products carried.

Weather is a big factor in the success or failure of crops in the heavy cotton-producing area, so Mr. Frazier feels the gauge is a natural.

"Since the gauge tube is glass, it often freezes and breaks in the winter if the farmer doesn't empty it," Mr. Frazier said. "But he's back in my store asking for another one the following spring."

Other giveaway items include scratch pads, pencils and pens. Besides giving pencils to customers, Mr. Frazier leaves a supply at the local high school. He figures it is important to get his name known among the younger set and that many of them will take the pencils home where their parents will use them.

Advertising in the high school paper is viewed in the same manner. This type advertising may be considered as a good will builder, of course, but Mr. Frazier says, "Those papers go home with the students. They are read by parents who either are my customers or potential customers. In fact, I think they are read with greater interest than most dailies and weekly newspapers."

Another type of advertising used by the store, established three years ago, is a "planters' guide" distributed by the county agent. The 6 by 9 in. booklet, which carries Mr. Frazier's ad on the back cover, is filled with page after page of agricultural information, including recommendations on fertilizer and insecticides. Mr. Frazier says the guide answers "most any question a farmer might have."

Besides these types of advertising, the store uses an occasional direct mail piece.

The store stocks a full line of Ful-O-Pep feeds, Olin Mathieson insecticides, Lion and Mississippi Chemical Co. fertilizers, herbicides, and field seeds.

While the advertising program helps attract people to the store, Mr. Frazier feels that "service is what gets and holds a customer."

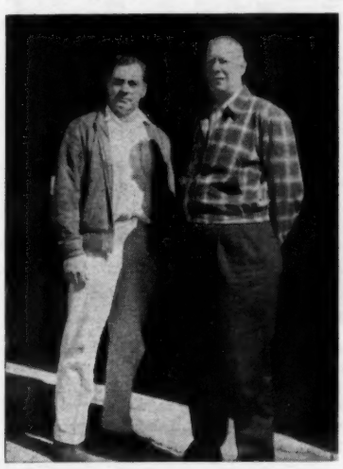
Store hours are "when somebody needs something." Mr. Frazier some times gets up as early as 4 a.m. to deliver cotton insecticides. Being near the Delta Branch Experiment Sta-

(Turn to ADVERTISING, page 13)

Good Location, Atmosphere, Parking Spell Success for Iowa Business

By LAWRENCE A. LONG
Editor of Croplife

A well established location on a heavily traveled highway at the edge of Ottumwa, Iowa . . . plus plenty of parking space and a friendly atmosphere are ingredients that help make the Huber Feed, Seed & Fertilizer retail establishment a success story. Situated in a concrete block building of unpretentious design, the store is functional throughout and according to its proprietor, Maurice Huber, the farmers who comprise about 95% of his trade feel right at home in these surroundings.



DEALER AND SUPPLIER—M. Huber, left, proprietor of Huber Feed, Seed & Fertilizer store, Ottumwa, Iowa, chats with Harry Davis of nearby Super-Crop Fertilizer Co., maker of most of the plant food products handled by the retailer.

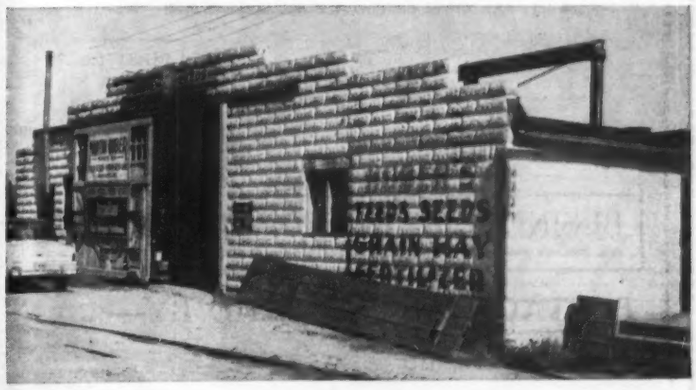
Mr. Huber is a booster for fertilizer sales, although the item is seasonal in nature. "We really sell it during the spring season," Mr. Huber comments. "Our customers come in here and haul it away by the truckload," he reports. "In one five day period during the spring, we sold 100 tons of bagged fertilizer from our store. That's quite a volume for a place of this size."

Actually, the size of the store and the extent of activity that goes on within its concrete walls are more than meets the eye. During the 1959 season, the establishment has sold some 35 carloads of fertilizer, around a thousand tons, nearly all of which is the "Super-Crop" brand, made in Ottumwa in a plant only a short distance from the store.

Because of this proximity and the close cooperation between supplier and dealer, Mr. Huber is able to get in extra supplies within a matter of hours, even during the rush season. Mr. Huber and Harry Davis, superintendent of the fertilizer manufacturing plant, are personal friends and this relationship carries over into their business associations.

The Huber store has been in the same location for the past 20 years, although the firm was first established in 1911. Highway No. 63, a main north-south thoroughfare leading through southern Wapello County into Davis County, affords easy

(Turn to SUCCESS, page 15)



RETAIL STORE—Exterior of Huber store is unpretentious, but farmer customers for miles around feel at home in it, prove their loyalty by heavy purchases of fertilizers, feed and seed. Ample parking space at sides and rear of building solve that problem for customers.

WHAT'S NEW

IN PRODUCTS · SERVICES · LITERATURE

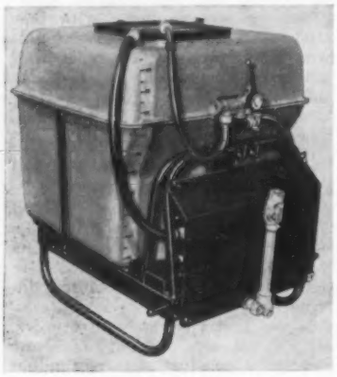
To obtain more information about items mentioned in this department simply: (1) Clip out the entire coupon in the lower corner of this page. (2) Circle the numbers of the items of which you want more information. Fill in the name and address portions. (3) Fold the coupon double with the return address portion on the outside and fasten the edges with a staple, cellophane tape or glue. (4) Drop in the mail box.

No. 6978—Heavy-Duty Liner

A heavy-duty liner made of chemically resistant material has been announced by Protective Lining Corp. The liner, predominantly for 55 gal. size, has a specially constructed round bottom to fit the standard steel drum neatly, the company says. The liner has a temperature range of from —25° to 230° F. It is chemically resistant to most chemicals, except very heavy acids in concentrated form, the company says. For more information, check No. 6978 on the coupon and mail.

No. 6981—Sprayer Unit

Hanson Equipment Co. announces the "Trak-Pak" sprayer unit. The unit mounts on any standard three-point hydraulic hitch. The unit can be equipped with either a boom or



Brodjet sprayer. A universal-joint drive shaft from the tractor power-take-off powers the pump-agitator assembly. An all-welded steel frame supports the tank, pump and sprayer unit. When not in use, the unit rests on its built-in skid stand, the company says. For more details, check No. 6981 on the coupon and mail.

No. 6979—Dryer Bulletin

General American Transportation Corp. announces the availability of Bulletin 59-L pertaining to rotary drying equipment. The bulletin contains sections on selecting dryer types, construction, counter-current dryers, parallel-current dryers, indirect-heat dryers, return-current dryers and many other types. A section also deals with other rotary equipment. For copies of the bulletin, check No. 6979 on the coupon and mail.

No. 6977—Fork Truck Attachment

Vac-U-Lift division of the Siegler Corp. announces a fork truck attachment utilizing vacuum for handling of barrels, plate, sheet or stone. The attachment is entirely self-contained, the company says, with four 10 in. Vac-U-Lift pads mounted directly to the frame which slips onto the forks of the truck. The pads are adjustable from 19 in. to 29 in. the long way of the fork and from 20 in. to 28 in. between the forks. Lifting capacity of each pad is 500 lb. with a total capa-

city of 2,000 lb. Power is furnished by a gasoline engine which drives the vacuum pump and contains its own reserve vacuum system to assure safety in the event of engine failure, the company says. The pendant control panel is in easy access to the operator. For more information, check No. 6977 on the coupon and mail.

No. 6980—Bulk Delivery Unit

Bulk delivery of fertilizer with any type of truck is possible with auger-equipped truck bodies being offered by Knoedler Manufacturers, company literature stated. The galvanized steel body is available with weather-tight cover, sack hauling space and a hydraulically operated boom auger to reach storage facilities. Basic models

are the 12 ft. and 8 ft. lengths, with top box extensions increasing the capacity of each so that the actual range of sizes is 2, 2½, 3, 4 and 5 tons. Twin compartments permit hauling different types of fertilizers, the company says. A "guillotine" shut-off system is available to allow either compartment to be unloaded at any time. More information is available by checking No. 6980 on the coupon and mailing.

Also Available

The following items have appeared in previous issues of Croplife. They are reprinted to help keep dealers on the regional circulation plan informed of "What's New."

No. 6974—Urea Fact Sheet

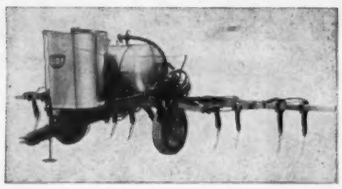
The chemicals division of Olin Mathieson Chemical Corp. has published a four-page fact sheet on Mathieson urea. The brochure shows the availability of the product in the East through the firm's North Claymont, Del., plant and also points up engineering improvements designed to produce highest grade prilled and crystalline urea, the company says. The urea will be produced by SunOlin Chemical Co., jointly owned by Sun Oil Co. and Olin Mathieson. Copies of the fact sheet and further information can be obtained by checking No. 6974 on the coupon and mailing to this publication.

No. 6970—General Catalog

The 1959-60 edition of the Dow Chemical Co.'s general catalog is now available. The 44-page publication, called "Products of the Dow Chemical Company," lists the properties and uses of some 375 industrial, pharmaceutical and agricultural chemicals currently produced by the firm. The listing includes established products and developmental items. For copies of the catalog, check No. 6970 on the coupon and mail.

No. 6973—Liquid Fertilizer Spreader

The John Blue Co., Inc., announces the "Nitro-Shooter Dual Purpose Series 80" liquid fertilizer spreaders. The unit comes equipped for simultaneous application of anhydrous ammonia and phosphoric acid. The machine may be equipped with either a standard 14 ft. tool bar or a 21 ft.



tool bar, for six row application. The machine is pictured with 200 gal. ammonia tank, 100 gal. phosphoric acid tank and variable stroke metering pumps for both anhydrous ammonia and phosphoric acid. The ammonia pump is of new design which permits it to meter accurately 200 to 6,000 lb. of ammonia per hour, the company says. For more information, check No. 6973 on the coupon and mail.

No. 6969—Stainless Steel Sprayer

A stainless steel sprayer with electrically seam-welded joints and threaded fittings to prevent leaks has been announced by the Lofstrand Co. The stainless steel combats corrosive action of some insecticides, the company says, and gives the sprayer a long live. The unit is equipped with a

shoulder sling for easy handling. This sprayer is the accepted standard model for U.S. Army Engineers, the company says. For more information, check No. 6969 on the coupon and mail.

No. 6975—Marking Ink

Ink in spray cans for stencilling steel drums and other containers has been announced by Reynolds Ink, Inc. The inks are available in nine colors, dry almost instantly and are weather

Send me information on the items marked:

- ☐ No. 6968—Control Valve, Selector
- ☐ No. 6969—Stainless Steel Sprayer
- ☐ No. 6970—General Catalog
- ☐ No. 6971—Accident Booklet
- ☐ No. 6972—Descriptive Brochure
- ☐ No. 6973—Liquid Fertilizer Spreader
- ☐ No. 6974—Urea Fact Sheet
- ☐ No. 6975—Marking Ink
- ☐ No. 6976—Insect Control Machine
- ☐ No. 6977—Fork Truck Attachment
- ☐ No. 6978—Heavy-Duty Liner
- ☐ No. 6979—Dryer Bulletin
- ☐ No. 6980—Bulk Delivery Unit
- ☐ No. 6981—Sprayer Unit
- ☐ No. 7688—Bulk Material Trailer

(PLEASE PRINT OR TYPE)

NAME .....

COMPANY .....

ADDRESS .....

CLIP OUT—FOLD OVER ON THIS LINE—FASTEN (STAPLE, TAPE, GLUE)—MAIL

FIRST CLASS PERMIT No. 2
(Sec. 34.9, P. L. & R.)
MINNEAPOLIS, MINN.

BUSINESS REPLY ENVELOPE
No postage stamp necessary if mailed in the United States

POSTAGE WILL BE PAID BY—

Croplife

P. O. Box 67

Reader Service Dept. Minneapolis 40, Minn.

and waterproof, the company says. The inks are not limited to stencilling steel drums, but can be used for stencilling containers of every sort and for color coding and identification marking, the company says. For more information, check No. 6975 on the coupon and mail.

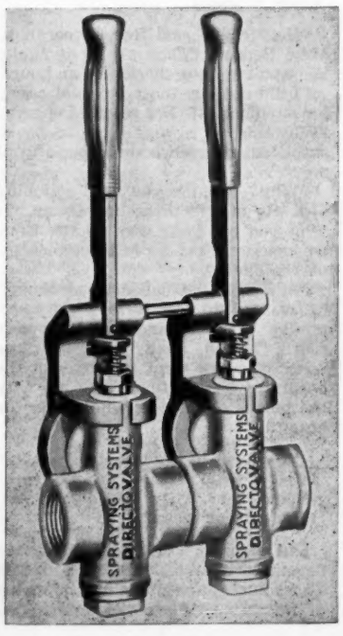
No. 6976—Insect Control Machine

An all-purpose insect control machine that can be used for air-blast spraying, high volume spraying with a hose, dusting or pellet broadcasting, has been announced by Besler Corp. The machine has a 35 in. axial-flow type blower. The motor is 56 h.p., Wisconsin air-cooled. Other features include adjustable vanes in the volutes that direct columns of insecticide-filled air. A provision is made for a

small spray boom to cover the area directly under the machine when it is used for spraying row crops, the company said. For more information, check No. 6976 on the coupon and mail to this publication.

No. 6968—Control Valve, Selector

Spraying Systems Co. announces its new control valve and selector for spray rigs, called the "DirectoValve." All parts of the valve that are touched by chemicals are made of either nylon or stainless steel, the company says. The valves are supplied in one, two, three or four port designs. Pictured is the two-outlet-port valve for use with a two-section boom. Each valve section is opened by lowering the pivoted handle. The unit can be positioned anywhere adjacent to the tractor seat for the convenience of the operator, the company says. Design feature, according to company literature, is that the valve provides a by-



pass when closed, protecting hose lines, fittings and pump from excessive pressure buildups. For more information, check No. 6968 on the coupon and mail.

No. 6971—Accident Booklet

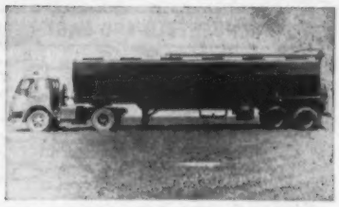
The 1959 edition of "Accident Facts," the National Safety Council's statistical yearbook, is now available. It contains facts and figures on all types of accidents—home, traffic, industrial, public, farm and school. Several sections are devoted to industrial accidents, the council said, and provide a comprehensive background for an industrial safety program. The booklet contains a list of accident rates by major industry groups, accident trends, the part of the body most often injured in accidents and off-the-job accident problems. For information on the booklet and quantity prices, check No. 6971 on the coupon and mail.

No. 6972—Descriptive Brochure

A brochure containing information about the services of the Bio-Search & Development Co. has been made available. The brochure describes the company's bioanalytical service whereby coded chemicals may be submitted for bioassay in all areas of biological activity and use. A section on the company's personnel and system, plus charts on the firm's search and development program and stages of bio-testing are included. For copies of the brochure, check No. 6972 on the coupon and mail.

No. 7688—Bulk Material Trailer

A semi-trailer "Skoop Skipper" has been added to the Pamco line by Productive Acres Manufacturing Co. The unit combines all the features of the Skoop Skipper with a larger capacity,



the company says. It loads and unloads and handles many bulk materials including corn cobs, feed and fertilizer. A positive seal assures against leakage of feed or other materials from the compartments, the company noted. Each auger is driven individually by its own hydraulic motor. If any auger binds due to foreign objects in the material being handled, a safety valve immediately stops operation. The trailer's master control unit at the rear is designed for complete and easy operational control. For more information, check No. 7688 on the coupon and mail.

Price and product merchandising with SF State & Regional Editions!

20 State & Regional Editions of Successful Farming—in January 1960

Edition	States	Circulation*	B&W Pg. Rate
1	Iowa, Illinois, Indiana, Nebraska, Minnesota, Wisconsin	608,297	$3,955
2	Illinois, Indiana	218,956	$1,860
3	Iowa	128,670	$1,160
4	Minnesota	116,748	$1,050
5	Nebraska	67,646	$ 625
6	North Dakota, South Dakota	82,225	$ 760
7	Wisconsin	76,277	$ 705
8	Iowa, Illinois, Indiana	347,626	$2,780
9	Iowa, Minnesota	245,418	$2,085
10	Iowa, Nebraska	196,316	$1,720
11	Minnesota, Wisconsin	193,025	$1,690
12	Minnesota, North Dakota, South Dakota	198,973	$1,740
13	North Dakota, South Dakota, Nebraska	149,871	$1,350
14	Illinois, Indiana, Ohio	320,412	$2,565
15	Iowa, Minnesota, North Dakota, South Dakota, Nebraska	395,289	$3,065
16	Iowa, Illinois, Indiana, Wisconsin, Minnesota	540,651	$3,785
17	Illinois, Indiana, Ohio, Wisconsin, Michigan	464,985	$3,370
18	North Dakota, South Dakota, Nebraska, Kansas	217,241	$1,850
19	Iowa, Nebraska, Kansas, Missouri	339,268	$2,715
20	Middle Atlantic, New England	138,385	$1,245

*A.B.C. Publisher's Statement, 12/31/58

Fertilizer advertisers soon will be able to combine local and national advertising — through the 20 State & Regional Editions of SUCCESSFUL FARMING, *to be inaugurated January 1, 1960, in addition to the National Edition.*

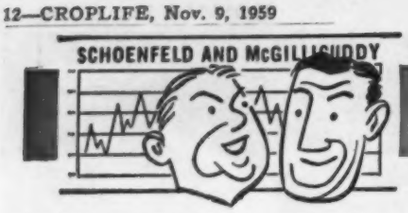
Opposite any four-color page of "national" institutional or product advertising, the SF advertiser can have a facing "local" page tie-in ad, featuring price, and listing dealers, either in black and white or black plus one color — a new type of "spread" highly effective for selling and merchandising.

The facing pages of the spread both get the prestige and power of SUCCESSFUL FARMING . . . editorial excellence, fine reproduction, long life. And the spread enjoys the SF *influence*, based on 57 years of service, helping farmers earn more money and live better—an audience with big farms averaging 336 acres, and these farm families have received an annual average estimated cash farm income of around $10,000 for the past decade . . . which reached the new high last year of $12,120!

Fertilizer advertisers — plan 1960 schedules now, and get the advantages of this powerful merchandising medium!

Full facts, any SF office.

MEREDITH PUBLISHING COMPANY, Des Moines . . . *with offices in* New York, Chicago, Atlanta, Boston, Cleveland, Detroit, Los Angeles, Minneapolis, Philadelphia, St. Louis, and San Francisco.



OSCAR & PAT

Saturday was pay day at the Schoenfeld & McGillicuddy store and just about everyone in the place seemed happy on this day—except one person. And everyone's spirits rose as 12 noon approached for that was the magic hour when, as the warehouse men said, "The ghost walks" meaning the handing out by Oscar Schoenfeld of the green piece of paper which could make a wage or salary earner feel like a "big shot" at least until he started to pay his bills.

There was one man, however, who was not in a hurry to see the "ghost walk" and that was pudgy, balding, gimlet eyed Oscar Schoenfeld. Since he and Pat had to co-sign checks in this partnership, Oscar naturally signed last, and he delayed affixing his signature on the checks until the last second before the noon whistle at the wooden pail factory.

Regularly at about 11:45, Oscar would get up from his desk, march into the warehouse and start snooping "aroundt." "Corcoran," he would call, "this aisle ain't so clean. Haf the boys sweep it up." Or, "The men's room wastebasket ain't emptied." Or, "The sliding door here squeaks. Have one of the men oil it before noon, so we're all ready yet for business Monday mornink."

If there was one time when the employees "stepped lively" for Oscar, it was late on Saturday morning. For they knew he would not affix his signature to their paychecks until they had done all his "final inspection" hints, even if this meant 12:15 or 12:30 or even later.

A psychiatrist would probably say that Oscar gave these last minute orders because he hated to part with money—to anyone. But Oscar himself felt that these were last minute jobs the employees ought to have cleaned up by themselves without being told, instead of just standink aroundt waiting for the noon whistle to blow and the "ghost to walk."

Always, Oscar signed Pat's check last, no matter how anxious Pat was to have it. When Pat asked for advances on his weekly salary Oscar often remarked the firm should ask Pat interest for this privilege. And when Pat submitted a list of expenses to be added to his salary check, Oscar would spend many minutes studying these figures and checking on them.

"Ach, how that man spendts money!" Oscar would wail like a wounded banshee. "Andt the farmers he buys coffee for when he meets them downtown. And doughnuts, too. Can't we buy a box of crackers and let Pat stuff his pockets full of them effery day? Then he will only haf to buy coffee for farmers—not doughnuts."

On this Saturday morning Oscar sat looking over the paychecks which Tillie had made out and Pat had already signed. Pat then had gone to the country. Oscar and he had an arrangement; Oscar was to sign Pat's paycheck and put it on his desk before closing time. Then Pat could pick it up when he got in.

"Himmel!" Oscar exclaimed, as he studied Pat's expense sheet. "$8 for four boxes of candy? Has he gone crazy? Now he is buying candy for farmers."

"Not for farmers," put in Tillie. "I understood him to say it was for some nurses."

"Nurses!" exclaimed the shocked Oscar. "They don't buy fertilizer. Andt why shouldt we gif candy to anybody? That Pat shouldt see one of the nut doctors—andt pay for it himself."

Oscar did not have to wait for an explanation, for at this moment, hatless, blue eyed Pat McGillicuddy walked in. He seemed in a hurry.

"Got my check signed, Oscar?" he said. "I have to meet Nora and the kids. Have to buy shoes for two of them this afternoon."

"No, I haf not signed your check!" Oscar said importantly. "I want to know all about this $8 for four boxes of candy for nurses. McGillicuddy if you want to fool aroundt with other women, that is up to you. But this company is not goink to pay for candy for those floozies. No, siree."

The noon whistle at the pail factory shrieked forth its commotion at this time, which made conversation impossible anywhere in the little town, unless it was mouth to ear. And Oscar never got that close to Pat.

So Pat just glared at Oscar until the whistle died down like a wounded dog. Neither partner saw four anxious employees standing just inside the store near the warehouse entrance.

"Holy cow!" said Red Corcoran to Mike Benson. "They are at it again. We won't get our checks for an hour."

"I did not buy those boxes of candy for any floozies!" Pat retorted angrily. "Why do you always have to be so suspicious of everybody, especially of me?"

"Why? Because you need watching—plenty of it!" thundered Oscar. "If I let you haf your way all the time, we wouldt be busted in three months, maybe one!"

Pat's right fist balled up as though he wanted to use it in a very explosive manner, and his lips were tight. "Listen, penny pincher, those boxes of candy went to nurses at the hospital who are furnishing me with the names of farmers who are in the hospital."

"Farmers in the hospital!" ejaculated Oscar. "What do we care about that? They got doctors to take care of them."

Pat sighed. "Oscar, can't you see beyond this store once in a while? Those nurses are giving me the names of farmers who are sick and in the

3 *good reasons for good seasons with*

NORTHWEST FERTILIZER!

You'll find Northwest Fertilizer pays in several ways! These truly top-grade fertilizers, with free-flowing qualities (off your shelves — out of your customers' spreaders) mean increased profits for everyone!

• *YOUR CUSTOMERS prefer Northwest Fertilizer because of its proven quality and uniformity. Free-flowing Northwest is guaranteed not to cake or lump.*

• *DEALERS prefer Northwest Fertilizer because of the strength and quality of the bags. Careful packing has given Northwest the best reputation for car loadings, with a minimum of breakage in transit.*

• *EVERYONE benefits from the services Northwest gives their dealers. Now, fastest delivery ever, either direct from plant or warehouse.*

For a "good season"—at the cash register and in the field—order your Northwest Fertilizers NOW!

NW NORTHWEST FERTILIZER

NORTHWEST
Nitro-Chemicals Ltd.
MEDICINE HAT, ALBERTA, CANADA
U.S.A. SALES OFFICE: 210 South 5th Street, Minneapolis 2, Minn.

hospital for treatment. I go to visit these farmers nights. They like to have visitors. I stay only 10 minutes or so, but it is a wonderful good will building idea. The only way I can find out who they are is from the nurses. They check the records in spare time and tell me who are farmers. They have a way of finding out."

"Good will!" barked Oscar. "We don't need any good will. All we needt is to have those farmers pay their fertilizer bills. Some of them owe plenty for more than 60 days. And if they are in the hospital, they will make us wait that much longer."

"Not all those who are hospitalized are dead beat accounts," Pat said sharply. "Some are cash customers. I never try to sell them anything on such visits, but actually, I've gotten orders for 30 tons of fertilizer since I started visiting 10 days ago. When you visit with a farmer the subject always gets around to fertilizer."

"Pat," said Red Corcoran, "can we get out checks?"

Neither Pat nor Oscar heard him. "Sellink fertilizer in a hospital!" snapped Oscar. "Giving boxes of candy to nurses! Ach, why can't we schtick to the old ways of sellink fertilizer? They know we got it; let them come in and buy it—for cash. I would not be surprised McGillicuddy to see you sellink fertilizer in church."

"Well," conceded Pat, "if I shake hands with a farmer after service, ask about his wife and kids, and he says we should send out some fertilizer one of these days, what's wrong with that?"

Oscar rolled his eyes ceilingward and made a clicking noise with his tongue. "The place to sell fertilizer is in the store from 7 a.m. until 5:30 p.m. six days a week!" he dictated harshly. "I wouldt not sell anybody nottink on Sunday. The customers know when the store is open!"

"Pat," said Red Corcoran patiently, "can we have our checks?"

This time Pat heard him. "Oh, sure, Red. Sorry to keep you boys waiting." He took the signed checks and gave them to the employees. "Oscar and I are having a little conference."

"So we hear!" Red said drily. Outside he turned to Mike Benson, "It's 12:25, and I'll be late for dinner. Man, the wife will bawl me out. She never likes to have the roast dried out."

"Me, too," growled Benson. "My wifes a stickler for schedules, too, just like that Oscar. She could teach him a thing or two, believe it or not.'

ADVERTISING

(Continued from page 9)

tion, Stoneville, Miss., he often checks out a farmer's problem with the station and gets the information back for use by the farmer. Also he arranges for entomologists with insecticide companies to scout fields for farmer customers, and he feels "those commercial insect boys are doing a mighty fine job."

On many spraying or dusting jobs on cotton, Mr. Frazier works with a local aerial applicator. It's a mutual arrangement with Mr. Frazier steering customers his way and vice versa.

In addition to the farm supply store, Mr. Frazier operates a seed cleaner for grains, soybeans and cotton seed. He buys seed, cleans them, and bags and sells them.

Trout Feed & Seed Co.

The second Mississippi farm store owner is Walter E. Trout. In many ways, Trout Feed & Seed Co. in Shelby is similar to Mr. Frazier's operation. He carries a full line of Nutrena feeds; Armour, Spencer and Lion fertilizers; full range of insecticides; field and garden seeds; Ortho garden supplies; and other garden equipment. He also stocks chickens and supplies for pets.

Mr. Trout began business in 1948, when he bought out a feed business and turned it into a diversified farm supply store.

His answer to the lack of local advertising media is like Mr. Frazier's — but with several unique twists. In the first place, Mr. Trout has turned his name into a trademark. He has a large drawing of a fish posted over the door to his office, with the word "Trout" lettered over the body of the fish.

Has this been successful? "Well, if you had asked for me by name when you came into town," Mr. Trout says with a grin, "you probably would have trouble finding me. But if you had asked for 'Fish' you would have been directed to the store immediately."

The name has spread to other members of the family. "My son is called 'Minnow', and for a while people were calling my wife 'Whale' but she sort of discouraged that," he laughs.

Mr. Trout points out that while every dealer can't make effective use of his own name, he feels it is important for a dealer to establish some sort of identity in the minds of his customers.

Like Mr. Frazier, Mr. Trout feels children of his customers are important. He keeps a supply of bubble gum which he passes out to the younger set. An estimated 60 to 70 pieces are given away each week.

Mr. Trout also relies on giveaways. Items include pencils, pens and rainhats for the ladies. He says the rain hats have been very popular and that they tie in with a recent increase in interest on the part of women in garden and lawn supplies.

By taking advantage of cooperative opportunities, Mr. Trout adds impact to his own advertising. This usually takes the form of direct mail to some 370 customers, as well as billboards on leading highways. Mr. Trout supplements cooperative direct mail pieces with postal cards produced on his own machine. The pieces usually deal with a seasonal product, such as a cover crop or insecticides.

Three delivery trucks are maintained since Mr. Trout considers the delivery of items to the farm is very important. Another service is arranging for chemical company representatives to scout fields. Rounding out the program is free seed for 4-H club projects.

NEW OPERATOR

ROCKFORD, WASH.—The Tekoa Farm store of this community is now being operated by Vernon McCormick, who purchased the business from Neil Peirce and Norman Hansen. Mr. McCormick has been associated with the Associated Pea Growers for the past several years.

Dealers and formulators agree DETHMOR® WARFARIN makes rodent baits more effective *and* more profitable.

Eleven years of farm magazine advertising have established WARFARIN as the world's most famous rat and mouse killer. Tasteless, odorless, painless . . . WARFARIN is economical and completely effective. Rats never become bait shy or build tolerance. It's safe, too, . . . won't harm children, pets, or livestock when used as directed.

Feature, promote and sell WARFARIN baits *now* . . . while WARFARIN's national program is in full swing!

PENICK

Farm Chemical and Insecticide Division

S. B. PENICK & COMPANY • 100 CHURCH ST., NEW YORK 8 • 735 W. DIVISION ST., CHICAGO 10

Accounts Receivable Troubles Indicate Need for New Method

By F. E. HARTZLER
Croplife Special Writer

Having trouble with your accounts receivable? You haven't started to have trouble yet. A stud, of the rediscount rate and prime interest rate shows that these have not been as high since 1930 as they are now. The raising of this interest rate makes it imperative that you make some changes in your method of handling your accounts receivable.

Let me illustrate why. In the normal operation of a farm store dealer the costs of doing business will run around 92% of the sales. This is allowing for a management charge or salary of 5% and a profit of 3%. With these costs a sale of $100 looks like this:

Sales	$100
All selling costs	92
Less owner's salary	5
Profit	$ 3

Now if this is a cash sale you are in good shape. But suppose that this is not a cash sale, yet you must pay your bills; supplier, rent, and labor on time. Let's also suppose that you are one of the lucky boys who will be getting the low interest rate of 6%. Let's see what happens to that profit if you have to borrow money from the bank.

		Profit
$92 at 6% for one month	$0.46	$2.54
$92 at 6% for two months	.92	2.08
$92 at 6% for three months	1.38	1.62
$92 at 6% for four months	1.84	1.16
$92 at 6% for five months	2.30	.70
$92 at 6% for six months	2.76	.24

Now the profit is gone. If this goes on from here you are eating into your own salary.

		Out of your pocket
$92 at 6% for seven months	$3.22	$0.22
$92 at 6% for eight months	3.66	.66
$92 at 6% for nine months	4.12	1.12
$92 at 6% for ten months	4.58	1.58
$92 at 6% for eleven months	5.04	2.04
$92 at 6% for twelve months	5.50	2.50

Now if you have to pay 7 or 8% to the bank for money you borrow, then of course your figures will be even tighter. Quite obviously then some new methods of handling credit are in order for a great many stores. This new cost of business, the high price of money, is simply going to have to be passed on to the customer. This may be unfortunate, but a great many of the dealers simply do not have the margin left that will permit them to absorb this kind of an expense.

The first thing that the dealer needs to do is to get a clear picture of his present credit situation. For this purpose the credit aging form available through most credit bureaus and many associations is a must. Essentially it looks like this:

Credit Aging Form

Name	30 Days	60 Days	90 Days	Over
John Smith	$ 90		$100	
Jim Brown				$275
James Doe	200	$400		
Pete Smith	1,000			
Will Doe	750			
Totals	$2,040	$400	$100	$275

Every customer on your accounts receivable who has owed you money for more than thirty days should be listed on this sheet. The totals at the bottom are as good a summary as you can get of your accounts receivable. Now if you have never done this before, you may either be delighted or scared to death when you get through. At least you should know what shape your money is in. Let me repeat, the shape that your money is in, because this is your money that is out.

Basically the credit picture in this sample is not bad. There are some accounts that one should start after right now. You have $375 out that you cannot make a profit on now if you wanted to. By the time you send a couple of letters or make a trip out to see these people, your profit is gone.

The credit aging sheet is the first step in getting your accounts receivable into shape. The second step is to see what can be done to get the money in and to prevent any more from getting out for more than ninety days.

Now you may already find that many of the other businesses have been there ahead of you. Farm equipment, liquid petroleum dealers, and even the REA have been tightening credit procedures for years. As a matter of fact if your customer is smart he may plan to let your money ride for a while. It isn't costing him a thing, and any money that he would have to borrow to replace it would cost him 6%. If he had to pull his own money out of savings he would be losing 4%. So you may have some calls to make.

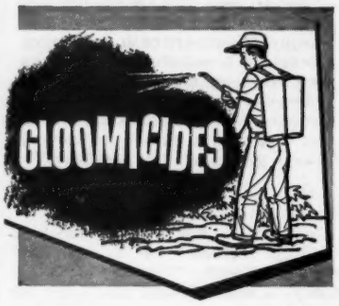
It is easier to take care before you extend credit, rather than after it is out, but this stuff is out so let's see what we can do about it. First of all, a regular credit follow-up system may be established. When a bill is more than 30 days overdue, a sticker should be used. When it is 45 days overdue, another sticker, and when it is 60, still another. Your credit bureau can be of great help in securing these stickers.

Any system that is used for more than six months tends to grow a little old. Little notes on the overdue bills might be written in the second six months. There are customers who will not take billing. However, there are not as many as you think. Experience in the liquid petroleum business shows that you may lose about 4% of your customers. The experience further shows, that this is the 4% you should have lost a long time ago.

However, once more the dealer should talk to his credit bureau about these practices and see what kind of materials they have that would help him. Most of the work suggested is not pleasant. It isn't even slightly pleasant. Most of it comes from carelessness, in the beginning, in the issuance of credit.

With this in mind let's look at safe practices in issuing new credit. The best that you can do is to start asking for a credit application on every new customer. For the old customers, when you make a sale that you know is going to be a credit sale, restate your terms. If you have outside salesmen selling for you, keep an up to date list of their accounts in the office and make sure that they don't let any heavy accounts get on the books for still more money.

Again use some judgment and good sense. There will be a few customers that you have to handle with kid gloves, but not too many. Just make up a credit aging form and see how many people you are financing. This will tell you what you are going to have to do. If you are in a spot where you are going to have to give credit, it might be wise to investigate the old 1% per month charge on the unpaid balance. With this new 6% and 8% money you are going to have to do something.



Having redecorated "Ye Olde Gifte Shoppe," the painter added his own sign: "Wette Painte."

★

Wouldn't it be a great idea to put the designers of ladies' bathing suits in charge of government budgets?

★

"And there, my son, you have the story of your dad and the great World War."

"Yes, Daddy, but why did they need all those other soldiers?"

★

The wild waves: Two lunatics, each firm in the belief that he was a lifeguard, escaped from an asylum and were trudging along the road in search of an ocean. Presently they came to a large wheat field which was rippling in the breeze a lot like waves in a sea.

Removing their clothes, they scrambled up a telephone pole and the first dived off. A moment later his head dazedly emerged from the wheat.

"Dive to the left," he cautioned his friend, "I hit a sandbar."

★

"I'm afraid I can't help you," he said to the man injured in a car accident. "I'm a veterinarian."

"You're just the man," moaned the victim. "I was a jackass to think I could do 70 on those old tires."

★

Bitten by the new car bug, he wrestled with the budget all night long until he finally concluded that it was impossible for him to buy a new car and support his wife too. It was a great disappointment to him, but he was a good sport about it; he drove her back to her mother's house in style.

★

Johnny: Mother, I've just knocked over the ladder in the garden.

Mother: Well. You'd better tell your father.

Johnny: He knows. He's hanging from the bedroom windowsill.

★

The new cashier was being exposed to store policy by the manager.

"Remember now," cautioned the manager, "we want you to practice the highest kind of business ethics here."

"Yes, sir," agreed the cashier.

"So," continued the manager, "when someone forgets his change, rap on the counter with a dollar bill."

OVER THE COUNTER

By Emmet J. Hoffman
Croplife Marketing Editor

Dealers need to be aware of significant changes that are taking place on farms and ranches of the U.S. In the opinion of J. G. Richard, assistant director, Louisiana State University, Agriculture Extension Service, here are some of the important factors that the farmer of tomorow will have to consider if he is to stay in the farming business.

1. He will have to do more thinking, planning and organizing and analyzing the facts to select alternatives, enterprises, new methods and techniques. He will have to give more attention to the farm layout, soil improvement and conservation, engineering and equipment. He will have to make maximum use of his resources of land, labor and capital. He will have to select alternative enterprises that go to make up the whole farm as an economic unit; efficient use of land and capital will have to be substituted for labor where possible.

2. The farmer of tomorrow will have to keep up-to-date and very current on market reports and outlook information, to determine when is the best time to sell and to buy.

3. He will have to use the recommended quality and quantity of fertilizer, as fertilizer is going to continue to be one of the best buys in the farm production outlay.

4. He will have to make intelligent use of new chemicals for control of insects and diseases, and for grass and weed control.

5. He will have to weed out low quality animals in his herd. Anytime is a good time to cull low producing livestock and to improve the foundation herd.

6. He will have to buy only the best of certified seeds and adapted hybrids when available.

7. He will have to increase production per man through wise use of farm machinery and labor saving techniques.

8. He will have to make wise use of farm credit, cut per unit cost, and increase yield per acre or per animal unit.

Following are some present day viewpoints on use of credit by farmers. This will affect a dealer's business:

a. Growth in capital investments on commercial-type farms, now approximately five times what it was in 1940, will continue to increase.

b. Use of credit. Now the highest ever although representing only 11% of total farm assets. Use of credit will grow still further. Full debt-free ownership of the larger commercial units may be declining as an accepted goal.

c. Increasing emphasis on financial management in extension education and research will continue to expand.

9. He will have to keep a good set of farm records and study them carefully to select alternative courses in the future and find out which farm operations are making money or losing money.

10. The farmer of tomorrow will have to be an active participant in his farm organization, so that his voice will be heard in state and national capitals, or wherever it needs to be heard.

what's NEW?
Broyhill
CRUSADER "220" Sprayer with PLASTI-CHEM tank.
PLASTI-CHEM
Lined Tanks resist corrosion of chemicals and liquid fertilizers.
Ideal for applying corrosive chemicals.
Nurse Tanks in 500 and 1,000 gal. sizes available.
Write to:
the Broyhill COMPANY DAKOTA CITY, NEBRASKA

FARM SERVICE DATA

EXTENSION SERVICE REPORTS

Aerating stored grain early in the fall to bring grain temperatures down near the average temperature of the outside air helps to prevent insect activity and spoilage in wheat and corn. This and other information from grain aeration tests in the Corn Belt are given in a report issued by the U.S. Department of Agriculture.

Researchers in USDA's Agricultural Marketing Service conducted these tests in Iowa and Indiana. The tests in Iowa included nine deep bins of shelled corn; those in Indiana included five flat and two tank-type storages of shelled corn, seven deep bins of wheat, and two oil-tank storages of soybeans. Various methods of operating the aeration systems were used.

Costs of operating aeration systems depend largely on the rate of airflow, depth and kind of grain aerated, and number of hours fan is operated. Typical operation costs vary from 1/20¢ bu. for aerating shelled corn in a flat storage to 1/3¢ bu. for aerating wheat in deep bins.

A free copy of the report, "Operating Grain Aeration Systems in the Corn Belt," Marketing Research Report No. 337, may be obtained from the Office of Information, U.S. Department of Agriculture, Washington 25, D.C.

★

Use of a growth regulator to increase flax yields may have possibilities, according to preliminary research conducted at South Dakota State College.

David J. Holden, associate professor of botany, has doubled the number of seed-containing capsules produced by individual flax plants in the greenhouse and in the field by applying a growth regulator called triiodobenzoic acid (TIBA). He points out, however, that much field research is needed before its effectiveness on whole fields can be determined.

The regulator, sprayed on the plant after the usual flowers have set, stimulates normally dormant buds to begin growth and produce flowers. Mr. Holden explains that the bud at the tip of a plant's stem or of each branch produces hormones that prevent the buds along the stem from growing. Anything that upsets the function of the bud at the tip allows the other buds along the stem to grow. This is what the growth regulator does.

It is essential to apply the proper amount of the growth regulator at the right time. Applied too early, it tends to give the flowers already formed an appearance similar to aster yellows. The wrong balance brings about various other abnormalities in the plants.

★

Autumn is the ideal season to apply phosphate and potash on established hay or pasture, says Russell K. Stivers, Purdue University extension agronomist.

Since the soil is generally firm in the fall, spreader trucks can broadcast fertilizer better than in the spring.

Where corn is to be grown the following year, hay or pasture sods are an excellent place for broadcasting fertilizer in the fall. Broadcast applications of relatively large amounts of available phosphate are necessary for maximum high yields of corn on some Indiana soils.

Fall fertilization, based on soil test levels, is recommended in Indiana for all winter grains, too. For wheat particularly, part of the nitrogen should be applied with phosphate and potash at planting in the fall. Additional nitrogen top dressing generally pays well in the spring, Mr. Stivers adds.

Mr. Stivers says that fall application of nitrogen for corn the following spring is not recommended under many conditions. Loss by leaching is so great on sands, sandy loams or well-drained salt loams that fall application results in inefficient use of nitrogen. On these soils it is better to wait until spring or to sidedress in summer for corn or grain sorghum, the agronomist adds.

SUCCESS

(Continued from page 9)

access to the store. Rural families using this route see the Huber store every time they go past.

Not all do go past, however, for great numbers of them stop and shop. Mr. Huber says that it is not unusual to have 30 or 40 autos in the ample parking spaces around the store, and a dozen or so at once is a rather ordinary sight. As mentioned earlier, most of these cars are from rural areas, rather than from the city.

The store's interior makes no pretense at being formal or glamorous. "The farmers feel at home here," Mr. Huber observes, "and we'd probably scare many of them away if we should modernize to the point of losing our character." The main area of the interior is full of stacked bags with aisles between where customers may look around and select what they want.

Helping customers make their selections are Bill Hendricks, employed full time, and Orval Harsch, who "helps around" as Mr. Huber put it.

While fertilizer and seeds form a main portion of Huber's volume during part of the year, the firm does a big business in feedstuffs. Its dogfood volume of around a carload a year is said to be one of the biggest in Iowa. Other materials handled include about a car each of ingredients, Wayne brand feed, and other assorted brands of feed materials.

FOLIAR APPLICATION...

GRACE A WORLD OF EXPERIENCE

Today's outstanding

Profit Opportunity

for you!

When you sell Grace Agricultural Grade Crystal Urea
A *Fast-Growing, Profitable* Market Opens For You

The use of Urea for foliar application on both vegetables and citrus is a fast-growing trend today. That's because this type of application gives the farmer a combination of top quality *and* maximum yields.

Grace Agricultural Grade Crystal Urea has several advantages. Its *low biuret content* (less than 0.2%) makes it safe; it is *especially formulated* for foliar application, and contains 46% nitrogen; it won't clog or damage spray equipment; and it is *completely* water soluble.

Sell Grace Agricultural Grade Crystal Urea ... and take advantage of these new profit opportunities. Here's how Grace helps you:

1. **NATIONAL ADVERTISING** *pre-sells* **for you!** Grace advertises its Agricultural Grade Crystal Urea to both vegetable and fruit growers nationally, with consistent, full-page, color advertisements. This *pre-selling* makes your job easier . . . more profitable.

2. **SELLING AIDS ARE YOURS—FREE!** Effective, tested selling aids like this informative booklet are yours free, for distribution to your customers. Grace gives you what it takes to do the job *right* . . . to establish your business as *headquarters* for foliar sprays.

WRITE FOR DETAILS

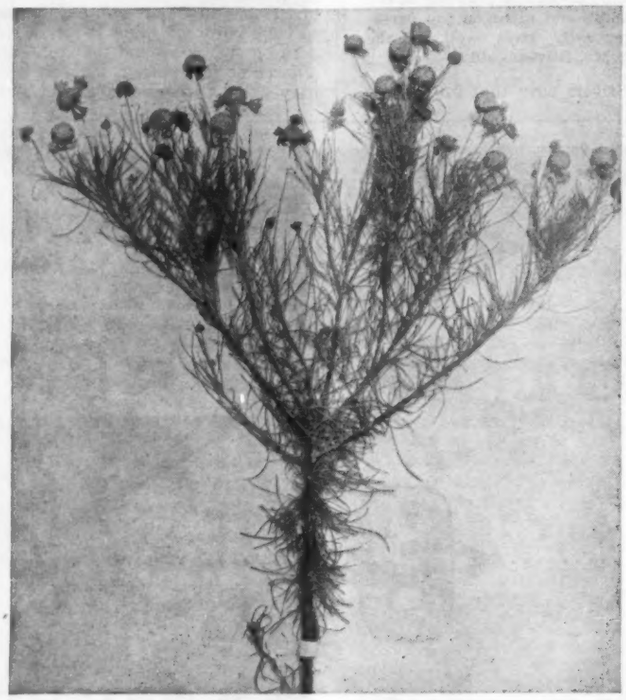
Grace Chemical Company

A DIVISION OF W. R. GRACE & CO.

MEMPHIS, TENN.

WEED OF THE WEEK

Mr. Dealer—Cut out this page for your bulletin board



Bitterweed

(Helenium tenuifolium)

How to Identify

This weed may range from 6 to 30 inches in height, with smooth, erect stems, branching in the upper portion. Leaves are numerous, smooth and thread-like. They are arranged in alternate fashion, and appear to be crowded along the main stem and branches. The flower heads are about ¾ inch in diameter, and the ray flowers are yellow with a toothed tip, surrounding a dome-shaped mass of yellow disc flowers.

Habits of Bitterweed

An annual plant, reproducing from seeds, it flowers from August to October, and seeds September to November. It is a North American native, and is distributed generally throughout the eastern portion of the U.S., particularly in the southeastern section of the country. It flourishes particularly in gardens, dooryards, waste places, and in lowland fields, especially in damp areas where rich soil is available.

Harm Done by Bitterweed

When eaten by livestock, the weed acts as a toxicant causing sneezing on the part of the animals. It is not usually serious unless large quantities are eaten by cows, horses and mules. When milk cows graze heavily on fields infested with this weed, however, they produce milk with a bitter taste, thus rendering it unmarketable. It is also objectionable when intermixed with prairie hay, because of its bitter properties.

Control of Bitterweed

Both chemical and cultural means of control are suggested by various authorities. A number of herbicides are effective, and cultural means of control are helpful if carried out over a period of several seasons.

Illustration of Bitterweed furnished through the courtesy of U.S. Department of Agriculture.

Weed, Nematode Problems Will Continue, Spencer Chemical Seminar Visitors Say

By THOMAS E. LETCH
Croplife Staff

KANSAS CITY—Weeds and nematodes are large obstacles in the path of efficient crop production that, despite strong efforts made by scientists to overcome them, will always be with us. This was an inescapable conclusion for anyone attending the Weed and Nematode Seminar sponsored by Spencer Chemical Co. at its research center here recently.

A panel of five weed and nematode scientists participated in the seminar. The previous day, Spencer Chemical Co. scientists and executives reported on successful tests conducted during the past growing season with Carbyne, the new herbicide developed by Spencer for controlling wild oats.

On the panel were Dr. Alden Crafts, department of botany, University of California, president of the Weed Society of America; J. Roe Foster, superintendent of the experiment farm, Indian Head, Saskatchewan, Canada, and president of the North Central Weed Control Conference; Dr. Dewey J. Raski, chairman of the department of plant nematology, University of California; Dr. Warren C. Shaw, head, weed control and crops, Crops Protection Research Branch, Crops Research Division, Agricultural Research Service, U.S. Department of Agriculture, Beltsville, Md.; Dr. David W. Staniforth, department of botany and plant pathology, Iowa State University. Moderator was Dr. Crafts. Dr. Nat C. Robertson, vice president, research and development for Spencer Chemical Co., introduced the panel.

Just how big is the nematode problem? Dr. Raski said that there wasn't much information on how prevalent nematodes are. But he said it had been estimated that $500 million was the annual U.S. loss attributed to nematodes, with California alone having $140 million loss; and he called these conservative estimates.

"There are enough kinds of nematodes that they are undoubtedly taking a bite out of all production. Some industries and some crops in certain areas have been completely put out of business because of nematodes," he said.

The degree of damage done by nematodes ranges from total to undetected losses, according to Dr. Raski.

To show how great the potential is if nematodes are controlled, Dr. Raski reported that in areas of California where they normally produce two bales of cotton per acre, they have increased yields to 3 to 3½ bales per acre at a cost of $15 per acre by controlling nematodes. "The potential is very great, all over the world," he said.

Among the nematodes which are known problems, Dr. Raski listed the following kinds: root knot, cyst-forming, sugar beet, lesion (both the Pratylenchus and the Radopholus), citrus, stem, foliar, stubby root, dagger and sheath nematodes.

As for controls, Dr. Raski said that some chemicals are effective and economical, especially with annual plants. But in many areas there are no answers for the problems. Among special problems, Dr. Raski listed these:

1. We need something to get rid of nematodes from roots of nursery stock before shipment.

2. We need chemicals that can be used in all kinds of soil, instead of in just certain types.

3. We need better controls to protect perennial crops.

4. We need a good post planting control—a fumigant, drench or systemic.

Among the soil fumigants in use, Dr. Raski listed dichloropropene, ethylene dibromide, dibromochloropropane, methyl bromide, chlorpicrin, vapam and mylone. He indicated that all have their limitations.

"What we seem to need," Dr. Raski said, "is a systemic nematocide. So far, none of them will accumulate in the root system in sufficient quantity to take care of the nematodes."

In answer to a question, Dr. Raski said that dollar return from investment in a chemical should be two to four times the cost of the chemical to gain acceptance.

Turning to weed problems, Dr. Crafts in his introduction pointed out that there is a natural succession to weeds and undesirable grasses that keeps us battling all the time. "When we take out one weed, we find that another weed becomes a problem. More seem to appear all the time. On rangeland, animals select the best grasses with the result that the less palatable grasses naturally take over because they have a chance to spread seeds. This same type of natural succession occurs in forest land."

Dr. Crafts reported on the use of herbicides to control weeds in specific crops. Many effective controls have been found, but many problems remain, he said.

In Western Canada, wild oats is the number one weed problem, said Mr. Foster. He said that 85% of the wheat acreage was infested to some extent and that 45% had heavy infestation. Wild oats cause large financial losses, he said, pointing out that wheat is docked for containing wild oats, and that there is a large transportation expense in shipping this dockage to market.

Mr. Foster reported on experiments with several chemicals for controlling wild oats. Pre-emergence chemicals have been tried. Chemicals have also been used to spray and kill the seeds. Another effort has been directed at getting the wild oats to grow up before the wheat so that they can be destroyed by cultivation.

Canada and sow thistle are also problems in Canada, Mr. Foster said. He said that infestations are more intense despite the availability of effective chemicals.

There is a big need for chemicals to use with horticultural crops, Mr. Foster continued.

For controlling weeds in such crops as corn and soybeans, Dr. Staniforth said he feels industry should search for something to keep weed seeds from germinating.

The major problems in these row crops in the Midwest, Dr. Staniforth said, are annual grasses, foxtail, smart weed and other annual weeds and perennial weeds. If cultivation can be minimized or eliminated, time and capital are saved, the Iowa State man pointed out.

In evaluating present methods of control, Dr. Staniforth said that "we don't get good control of grasses by spraying. There are several good pre-emergence chemicals but timely rainfall is needed to permit them to do a good job and substitute partially for cultivation. There are also materials applied during land preparation that are fairly effective."

With soybeans, he continued, there would seem to be a better opportunity for developing and introducing effective chemicals. Soybeans are weedier than corn, and the growers are a little better organized so that introduction would be easier.

Dr. Staniforth thought a pre-planting or pre-emergence chemical that could be applied in granular form would be more popular.

In corn, Dr. Staniforth noted that plenty of nitrogen will offset high weed infestation.

Dr. Shaw said weed control should be thought of as a total farm problem. Crop rotation, chemicals, chemical rotation, chemical combinations and all known methods should be employed in eliminating uneconomic vegetation from crops.

"We don't want a universal weed killer. What we want is a whole array of chemicals—all types and kinds—that can be used singly or in combinations to lick specific problems."

Dr. Shaw noted that more information is needed on the losses caused by weeds so that "we can plan a coordinated and effective research program." He called particularly for convincing the public of the importance of basic research.

"There is a tremendous need for scientists in weed control. Although there are very few weed scientists, last year more acres were treated with herbicides than were treated with insecticides, nematocides and fungicides," Dr. Shaw said.

Among other needs, Dr. Shaw cited: (1) need for expanded extension program in the weed control area; (2) need for improved equipment and for training farmers to use equipment properly — better liaison between biologists and equipment manufacturers (in this connection Dr. Shaw said that a critical problem is the lack of granular applicating equipment); (3) need for strong weed society.

To illustrate the importance of weed control by chemical means, Dr. Shaw cited figures showing that the conventional way of keeping weeds out of cotton cost $18.30 per acre and a total of 27 man hours, while with chemicals the cost was reduced to $13.01 and man hours to 11.7. In the last few years, further reductions have occurred, he said.

Weed Control Methods Subject of Meeting

CORVALLIS, ORE.—New ways to wage all-out war on Oregon weeds will receive top billing at this year's Oregon Weed Conference, reports Rex Warren, extension farm crops specialist at Oregon State College and secretary of the conference.

The eighth annual weed conference will be held in the YMCA building in Medford Nov. 12-13, Mr. Warren said. All persons interested in technical information as well as practical weed control are welcome to attend, he added.

New ways to use natural and imported insect enemies to control weeds will be one of the topics at the meeting. James K. Holloway, head of the parasite introduction center of the Agricultural Research Service station, Albany, Cal., will outline the whole field of biological control and report on success of using the Cynnabar moth to control tansy ragwort.

Another highlight on the two-day program will be a report by Otto Bohnert, Central Point, on how he uses herbicides on his farm. Mr. Bohnert was among the first to make commercial use of IPC to control ryegrass in Ladino clover and has been a leader in use of chemicals to control weeds, Mr. Warren said.

Ways to use new granular herbicides to control weeds in water channels and for selective control of weeds on rangelands will also be reported. Another discussion will give more information on use of benzoic acid chemicals for control of wild morning glory.

Control of weeds in orchards, along highways and roads, in seed and vegetable crops and in lawns will also be spotlighted at the meeting. A special session will bring those attending up to date on what to expect from laboratory test tubes in the future.

The conference dinner is set for the night of Nov. 12. A special tour of the Bear Creek Orchard packing plant has been arranged for ladies attending the meeting.

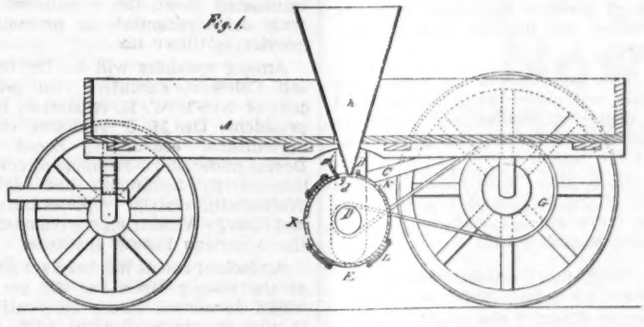
Container Plant

SAN LEANDRO, CAL. — A new manufacturing facility, Vulcan Containers Pacific Inc., has been established here, according to Lawrence M. Ferguson, president and sales director of the new company. According to Mr. Ferguson, who said the company is an independent California corporation, the new plant initially will produce steel pails in capacities ranging from 2½ through 6½ gallons and round tinplate cans in a wide variety of sizes from 1 through 25 pound capacities. Mr. Ferguson was formerly sales vice president of Vulcan Containers, Inc., Bellwood, Ill., where he was employed for more than 20 years. Richard E. Smith, formerly with Meyers Drum Co. and Rheem Mfg., both of California, has been named operational vice president.

Fertilizer Application

In Years Gone By

Fig. 1.



ONE MATTHAS W. FAUBION of Parrottsville, Tenn., 'way back in 1872 saw the need for better methods of fertilizer application, so he invented and patented a "new and valuable improvement in fertilizer distributors," illustration of which is shown above.

Mr. Faubion describes his device as having a distribution cylinder which rotates by means of belts activated by the wheels. The device was intended to be towed by a wagon which would carry a supply of the pulverized fertilizer.

The rate of application was governed by slides which made the openings larger or smaller, but apparently were not calibrated to distribute at any given number of pounds to the acre. However, the patent states that "when desirable to sow fertilizers with great freedom, all these slides may be removed" in order to apply generously.

The cylinder's pulleys were arranged on a high-geared basis, so the rotation of the device would be rapid enough to distribute the material over a wider area.

Research in the News

New systemic insecticides offer real promise for controlling cattle grubs which cause losses for Mississippi beef producers.

This was the report from M. P. Lewis, Jackson County agent. He said tests show costs of treatment have been more than offset through more rapid gains on less feed and higher market returns.

"Those heel flies chasing cattle each summer are laying eggs on the hairs of the animals' legs and flanks," Mr. Lewis said. When the eggs hatch, the very small grubs tunnel through the skin at the point where the eggs are laid. They spend the next six to nine months migrating through the connective tissues of the animal.

The agent said the first grubs usually reach the backs of Mississippi cattle in October and November. Then they encyst and form the warble or grub which are familiar sights.

After the grub reaches full size, it squeezes out through the breathing hole and drops to the ground. With the coming of warm weather, adult flies emerge and the cycle starts all over again.

The agent made several recommendations on control of the grubs.

Systemic grub killers attack the grub while it's still in the connective tissues of the animal's system. This can be the legs, gullet, back and other areas.

●

Using the amount of fertilizer recommended by a soil test more than doubled the forage production on a special Bermuda grass pasture demonstration in Benton County, Ark.

That's the report of Ben B. Price, county agent, who says larger amounts of fertilizer produced yields up to three times as much as those from an unfertilized plot.

The demonstration was conducted on the C. A. Wickman farm, which is located three miles south of Gravette, Ark.

A University of Arkansas soil test showed the land was very low in phosphorus and slightly low in potash.

Agricultural officials recommended that 30 lb. of nitrogen, 60 lb. of phosphate and 30 lb. of potash be applied for best results from the plot.

Mr. Wickman got these nutrients by using 300 lb. of 10-20-10 per acre. And he's very happy with the results.

He's also amazed at some of the results produced by varying rates of fertilization.

Working with county agents, Mr. Wickman applied various rates of fertilizer to different plots on May 20. The grass was harvested on June 29.

At one-half the recommended rate of fertilization, the yield was 2,246 lb. of dry weight forage, compared with only 1,156 lb. from an unfertilized plot.

The plot which was fertilized at the recommended rate produced 2,450 lb. of forage. Twice the recommended amount increased the yield to 3,698 lb.

Mr. Wickman says his cattle grazed better on the fertilized grass than that on which no plant nutrients were placed.

●

Less leaf spot disease is likely to develop in lawns of common Kentucky bluegrass and red fescue in the spring and summer if fertilizer is applied in the fall instead of spring, according to U.S. Department of Agriculture recommendations.

Three-year's research conducted by Drs. Felix V. Juska and Angus A. Hanson of USDA's Agricultural Research Service at Beltsville, Md., shows that fertilizing in the spring forces the grass into rapid tender growth, making it more susceptible to leaf spot in the hot weather. This disease, therefore, is reduced when there is little or no spring fertilization.

The scientists said, however, that their recommendation for fall fertilization of common Kentucky bluegrass and red fescue does not hold for Merion Kentucky bluegrass. This variety is quite resistant to leaf spot and, also, in most areas, it needs fertilization in fall, spring, and summer to make good turf.

The Beltsville studies show that split fertilizer applications—half in September and half in October—strengthen the plants without stimulating excessive top growth. Any applications in the spring, the scientists said, should be extremely light—only enough to make the grass green, but not enough to stimulate rapid growth.

In addition to reducing lawn-susceptibility to leaf spot, fall fertilization cuts down on the need for spring mowing. Fall fertilization, however, may be of less interest to persons growing common Kentucky bluegrass and red fescue in northern areas where leaf spot is less serious than it is in the South.

The research results were obtained with commercial fertilizers containing quickly-available nitrogen. Preliminary research indicates that slowly-available forms of nitrogen may not always produce adequate growth in the fall. Adverse weather conditions may retard the availability until spring when grass may be over-stimulated.

●

Weeds in Mississippi pastures cause a loss of 10 to 50% of good grazing, according to W. R. Thompson, extension pasture specialist.

Controlling weeds in both row crops and pastures is a big cost item in today's farming, he said. Many farmers list weeds as their number one problem in producing crops.

"This fall you will see small grain fields and clover fields almost solid in dock. Wild onions and garlic are also showing up in pastures throughout the South.

"Many times wild onions cause a loss of the biggest part of the grazing crops as dairymen cannot turn cows on such fields.

"Right now many permanent pastures are just about solid with weeds. Many of the weeds are 5 ft. tall. Pastures in such cases are short as what the livestock have not grazed out, the weeds have choked out," Mr. Thompson stated.

He advises a stepped up spray and clipping program to rid pastures of these weeds.

"During 1960 most emphasis should be placed on pasture weed control and pasture fertilization," he emphasized.

Installs Equipment

MOULTRIE, GA.—The C. O. Smith Guano Co. in Moultrie is installing complete granulation fertilizer equipment, which will enable the firm to offer complete granulated fertilizer.

William B. Black New Leffingwell President

WHITTIER, CAL.—William B. Black has been elected president of Leffingwell Chemical Co., Whittier, according to a recent announcement by the board of directors of the company. He has been sales manager of Leffingwell for the past five years, and a member of the board.

William B. Black

Mr. Black obtained his degree from the University of Oklahoma and at one time was associated with Creekmore Cotton Co. He joined Leffingwell Chemical Co. in 1952, and was made sales manager in 1954. His sales activities were chiefly concentrated in the field of insecticides, fungicides, fertilizers and nutritional foliar sprays manufactured by the California firm.

Fertilizer Sales Tools Feature of Iowa Meeting

WASHINGTON—Sales tools that can help National Plant Food Institute member company salesmen and dealers increase the use of fertilizer, will be presented at the NPFI-sponsored Iowa Fertilizer Promotion Workshop on Dec. 10 at the Savery Hotel, Des Moines.

Details of the all-day program built around Iowa information and Iowa people were made public recently.

All institute member companies doing business in Iowa are invited to send salesmen and dealers invited by members to the workshop. The program has been designed particularly for fertilizer salesmen. The information can provide ideas that individual companies can use to supplement their own sales training programs.

Four 15-minute sound equipped film strips comprising the fertilizer sales training course produced by Empire Sales Training, Inc., will be shown at intervals during the day.

Discussions accompanied by visual aids will center around topics such as "What Your Customer Is Like and What He Expects," "Why the Customer Needs Our Product," "What Is Our Customer's Potential?," "Some Available Selling Tools," "You and Your Community," and "Selling Fertilizer in Iowa."

Soil testing, yield goals, the use of college fertilizer recommendations and the use of fertilizer trials will be considered from the standpoint of their sales potentials in promoting greater fertilizer use.

Among speakers will be Dr. Russell Coleman, executive vice president of NPFI; W. R. Allstetter, vice president; Dr. M. S. Williams, chief agricultural economist; Zenas H. Beers, midwestern regional director; Edward R. Schumann and Arlan Woltemath, district representatives, and George Wickstrom, agronomist of the American Potash Institute.

A block of rooms has been set aside at the Savery Hotel for the use of NPFI members. Room reservations should be made directly with the hotel.

Net Income Reported

SALT LAKE CITY, UTAH—Lockwood W. Ferris, president of Bonneville, Ltd., Wendover solar potash producer, reported to shareholders that net income was $143,250 for fiscal year ended June 30, 1959, compared with a net of $32,826 for the previous fiscal year.

Net sales for the firm were $1,736,755 last fiscal year, compared to $1,204,487 for the 1957-58 term.

Current assets increased from $1,236,431 to $1,528,524 on June 30, 1959. Current liabilities went from $90,719 to $115,383, including reserve for payment of federal income taxes.

Spruce Budworm Infestations Increase

ALBUQUERQUE, N. M. — Spruce budworm infestations are "much more widespread" than last year in the Carson and Santa Fe National Forests and on the Navajo Reservation, according to F. M. Yasinski, field survey man for the forest insect and disease laboratory of the Rocky Mountain Forest and Range Experiment Station.

Douglas fir beetle damage has increased about 25% over last year, mainly in the Santa Fe Forest.

Mr. Yasinski and D. E. Pierce have just completed a six-months forest survey which shows infestation increases for the fir engraver beetle and the pine bark beetle in certain areas.

"An outbreak of the Engelmann spruce beetle on private land east of Chama is serious and bears watching," said Mr. Yasinski.

Most widespread of the insects checked is the spruce budworm of the mixed conifer type. The insect has infested 620,000 acres in the Carson and Santa Fe National Forests and adjacent private lands and 83,000 acres in the mountain ranges of the Navajo Indian Reservation in northwest New Mexico.

The budworm's growth has been controlled in the past by spraying with DDT and fuel oil.

Infestation of the Douglas fir tussoc moth, which has damaged Cibola National Forest lands in the Sandia Mountains, has been reduced with the spraying of 12,000 acres this year, according to Dahl Kirkpatrick, Forest Service timber management director.

The pine bark beetle, which kills ponderosa pine, was reported causing heavy losses in Lincoln National Forest.

The field survey men, under the direction of Dr. C. L. Massey, laboratory director, conduct their work with aerial surveys and on-the-ground biological checks.

Elmer D. Young, 60, Dies After Heart Attack

LOUISVILLE, KY. — Elmer D. Young, 60, former vice president and treasurer of the Tri-State Chemical Co., Henderson, Ky., died of a heart attack Oct. 22 at his home in Louisville.

Mr. Young, with Col. John W. Manning, organized the Tri-State Chemical Co. six years ago and until August of this year served as its vice president and general manager.

Prior to his Tri-State association he worked with the sales division of the North American Fertilizer Co. for about 15 years.

He was still a member of the board of Tri-State and was attending a directors' meeting shortly before the attack occurred.

Rocky Mountain Group Plans Dealer Meetings

DENVER, COLO. — The Rocky Mountain Plant Food Assn. announced three dealer sales meetings to take place during November.

The meetings will be held at Greeley, Colo., Nov. 17; Pueblo, Colo., Nov. 18, and Grand Junction Nov. 20.

According to John J. Heitz, association secretary-treasurer, a main speaker on the program will be S. F. Sparks, director of sales development for Phillips Petroleum Co., who will discuss "Selling Fertilizer." Assisting him will be W. E. Irwin, Phillips sales development division.

Dr. Richard B. Bahme, National Plant Food Institute, will talk on "Farmers' Attitudes Towards Fertilizers," and Rodney Tucker, Colorado State University, will discuss fertilizer recommendations for specific crops in the area involved.

FISH, WILDLIFE

(Continued from page 3)

by many uninformed individuals that an insect cannot be eradicated is erroneous. However, there are better opportunities of eradicating some insects than others, depending upon the knowledge at hand on the biology of the insect, the extent of infestation, and the availability of sound and economically practical control measures. Another misconception is the idea that natural enemies will provide economic control of most insect pests. Let us review a few examples:

The Japanese beetle, a serious pest of many plants, has been subject to quarantines and control efforts for many years. Over a million and a half parasites, representing 34 species, were imported from 1920 to 1933 for study and colonization against this beetle. Two species have become established and are quite effective. Also, milky disease organisms that kill the grubs have been widely distributed and have helped appreciably in controlling this pest.

However, these biological control agents have not eliminated the need of insecticides in some areas during years of unusual beetle abundance or retarded spread to new areas. Thus, DDT has been used extensively to control the grubs in turf, and occasionally some robins are killed as a result of the treatment. A number of other chlorinated hydrocarbon insecticides are now available for the treatment of soil to aid in the control of this pest.

Nevertheless, increased research by USDA is being directed to the development of an economical means of mass-producing the milky disease organisms on artificial media so that they may be more widely used to delay the spread of this insect and to lessen the need for insecticides. Had present-day methods and materials been available when the beetle was first discovered in New Jersey in 1916, it could have been eradicated at a fraction of the annual cost now required to control it and prevent further spread.

The recent federal-state cooperation eradication program to rid Florida of the Mediterranean fruit fly has attracted worldwide attention. In 1929 this insect became established in Florida and after a costly program and considerable disruption of growers and industry, it was eradicated. The recent program was started immediately after a new widespread infestation was discovered in Florida in 1956. This infestation was annihilated at a cost of $10 million.

Fortunately there had been about eight years of intensive research on fruit flies in our Honolulu, Hawaii, fruit fly laboratory, which provided basic information that was immediately available to control workers. An outstanding development was a malathion-protein hydrolysate bait spray that could be distributed from airplanes to attract and kill this fruit fly. Of special interest from the viewpoint of fish and wildlife conservation was the fact that this insecticide-bait combination required only about one-fourth as much toxicant as was previously needed to control the Medfly in orchards.

Cooperative studies by chemists and entomologists led to the development of several outstanding attractants that could be used to detect new Medfly infestations and also to measure the effectiveness of the spray program. Though the program was an emergency measure, it is gratifying that prompt action was taken and that adequate research information was available to enable control officials to execute an eradication program which interfered with grower and industry operations to only a minor degree.

Moreover, because of the nature of the spray applied, losses to fish and wildlife were negligible and confined to small fish particularly at bait farms. This is an example of how prompt action with a suitable insecticide has quickly rid our country of a pest which otherwise might have required chemical treatments by growers over a long period of years.

Another eradication program that has been handled with dispatch concerns the screw-worm fly, a pest that has cost southeastern livestock growers about $20 million a year. The basis for this program was an original concept of E. F. Knipling, director of the entomology research division, and had been proved out by laboratory and field evaluations. It represents a major breakthrough on the peaceful use of atomic energy and is based on the so-called sterile male technique.

Male screwworm flies, sterilized by exposure of the pupae to irradiation of a cobalt-60 source, mate in a normal manner with females, but the resulting eggs are infertile. Therefore, by rearing and distributing large numbers of sterile insects over a period of time, it is possible to overwhelm the native populations and bring about elimination of the species.

This is a fascinating story covering some outstanding research work over a period of 20 years, which finally led to the development of a mass rearing technique, methods of irradiating large numbers of flies, and devices for dispersing them from airplanes throughout the infested area. The federal-state eradication unit at Sebring, Florida, had an operation under way in which 50 million screwworm flies per week were being reared, sterlized, and released.

It appears that the screwworm has virtually been eliminated from the Southeast. This program has been of great interest to wildlife workers because it has saved deer and many other animals that are killed as a result of screwworm attack and also because this type of insect control has no adverse effect on fish and wildlife.

Need for Public Relations

It may be that research scientists, pest-control officials, administrators, and the insecticide industry have been negligent or ineffective in their public-relations work to keep citizens informed on the necessity for use of insecticides and other agricultural chemicals. This seems to be particularly true of large-scale insect control or eradication programs involving many properties and varied interests. A special effort should be made to get across the aims of these programs in all sorts of informational media in order to reach all individuals who may be affected or have an overall interest in them.

The sensational stories in the press on the harmful effects of insecticides, whether true or untrue, will cause the public to be more apprehensive of future insect-control programs. If the public is made fully aware of the need for the program, the manner in which it will be conducted, and of the short- and long-range benefits, it is more likely to be cooperative and assist in carrying the program to fruition. On the other hand, pest-control officials cannot expect the public to accept without protest an insecticide treatment that causes a substantial loss of fish and wildlife.

Since 1945 DDT has been successfully dispersed from airplanes at the rate of one pound an acre for the control of a number of forest insects. The record with regard to damage to fish and wildlife has been very good, and hence it was somewhat surprising that an issue was made in connection with its use against the gypsy moth in New York in 1957.

In 1958 an entirely different attitude prevailed where timberland owners in Maine cooperated with the State Forestry Service to save about 300,000 acres of spruce-fir forest by aerial spraying with DDT at the same rate. It is my understanding that an excellent public-relations program was carried out prior to this spraying and that land owners were pleased with the results. The conservation foundation was also interested in this program and supported research to determine the effects of the spray on forest reproduction. The foundation was able to obtain support from the land owners for the hire of an aquatic entomologist to follow this phase of the work.

Future Research Needs

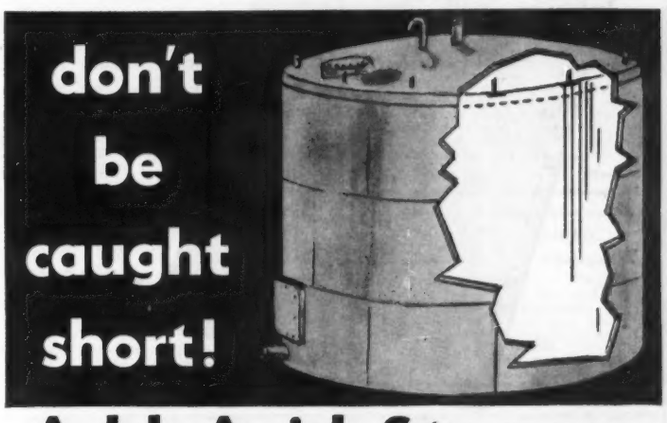
The entomology research division is constantly adjusting its research program to meet the most important insect-control problems. However, in view of the many and varied problems in need of attention, without adequate support it is not possible to give even the crisis problems the full attention they should have. Although there has been much criticism of the use of insecticides, particularly on large-scale programs, there is little evidence of provision being made for the additional qualified personnel and modern facilities required for the highly specialized and long-time investigations needed.

There is urgent need for expanded research on various biological-control agents, attractants, radiation, chemical sterilizing agents, repellents, and other chemical and biological approaches to insect control which might lessen the problems that have arisen in connection with the extensive use of certain insecticides. Insecticides will continue to be required to control many insects.

It therefore behooves those interested to do all they can to assure that the necessary studies are conducted upon which to make sound use recommendations. Pest-control operators must assume full responsibility for procedures to insure that proper dosages are applied to target areas.

An important aspect is field evaluation of the effects of insecticides on fish and wildlife from both short- and long-time standpoints. There is urgent need for fishery biologists and other wildlife experts in cooperation with entomologists, chemists, toxicologists, and others to evaluate their effects when used at the dosages required for insect control. Large-scale field tests are expensive operations, but this is the only way the true effects may be ascertained. The study of sizeable treated areas will provide sound information as to whether or not insecticides destined for broad use can be used without endangering fish and wildlife.

The chemical industry should assume a more prominent role in arranging for such investigations or underwriting some of the studies undertaken by agencies fitted to make them. There are important gaps in information on the many worthwhile insecticides that have become available since DDT. Let's conduct intensive research on all these materials so that they can be used as needed with a minimum of hazard to higher animals.



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Collier to Build Two New Plants In California

LOS ANGELES, CAL.—Collier Carbon & Chemical Corp. announced that it will build facilities for the production of sulfuric acid and ammonium sulfate near Wilmington, Cal., on an 11 acre site secured under long term lease from Union Oil Company of California.

Robert T. Collier, president of Collier, said that the multi-million dollar facilities will consist of two units. A contact acid plant will convert hydrogen sulfide, sulfur, and spent alkylation acid into virgin sulfuric acid.

The other new plant will be an improved process utilizing fresh acid and producing a premium grade of ammonium sulfate to be marketed under Collier's Brea brand to the agricultural trade. This plant will have increased capacity and will replace outmoded refinery facilities currently operated which utilize spent acid.

The new facilities will be equipped with modern air pollution control devices and will be in full compliance with existing APCD regulations, Mr. Collier said.

Both of the new plants are scheduled for completion late in 1960.

Penick Establishes Third Foreign Subsidiary

NEW YORK—S. B. Penick & Co., New York, announces the organization of its third foreign subsidiary, S. B. Penick & Cia. de Mexico, S.A., in Mexico City. The other two branches are located in England and France.

The operations of the Mexican branch will be under the supervision of A. J. Dotres, director of foreign operations. Mr. Dotres also directs the activities of the English and French branches from Penick's New York headquarters.

Hooker to Establish New Corporate Headquarters

NIAGARA FALLS, N.Y.—The board of directors of Hooker Chemical Corp. has voted to establish corporate headquarters in New York City some months hence, announced Thomas E. Moffitt, president. The decision involves only some 15 to 20 people in certain corporate departments out of approximately 461 corporate personnel and a total of about 2,550 employed by Hooker at Niagara Falls, Mr. Moffitt said.

INFESTATION HALTED

DONALDSONVILLE, LA.—Claude Songy, county agent, reports that the infestation of army worms in Ascension parish sugar cane discovered on Palo Alto plantations recently, has been halted. One other Ascension sugar farmer, Henry Simon, found army worms, but these, too, have been wiped out, Mr. Songy said. No other infestations were reported.

Coastal Chemical Schedules Large Export Shipment

PASCAGOULA, MISS.—A major water-borne fertilizer export shipment is scheduled to leave here this week.

It will consist of 11,000 tons of high analysis mixed fertilizer made by the Coastal Chemical Corp. plant at Bayou Casotte. The cargo, according to Wyeth T. Ramsay, export sales representative for Coastal and Mississippi Chemical in Yazoo City, is valued at approximately $1 million.

Consignee will be a semi-official-government agency at Cartagena, Colombia, which will distribute it to farmers in the area. It is Coastal's first shipment to South America, Mr. Ramsay said, and the beginning of what is hoped will be a major export trade for the Bayou Casotte plant.

Loading of the first shipment of 5,500 tons is scheduled to start between Nov. 9 and 16 and the second of the same amount in mid December. It will be loaded at the city-county port terminal on the west bank of Pascagoula. Each shipment will be the equivalent of 110 50-ton rail cars.

The west bank terminal is being used because Coastal's dock at Bayou Casotte is not large enough for ocean-going vessels.

Chemagro Elects Three New Officers

Allan R. Bennett R. W. Dammann

KANSAS CITY, MO.—Three new officers have been elected by the board of directors of Chemagro Corp., Kansas City, announced H. F. Tomasek, president.

Charles V. Jones

They are: Charles V. Jones, treasurer; Allan R. Bennett, assistant treasurer, and Robert W. Dammann, secretary.

Mr. Jones has been with Chemagro since 1956 and has been assistant treasurer since 1957. A graduate of Long Island University with a B.S. degree in accounting, he is a member of the American Institute of Certified Public Accountants and the New York Society of Certified Public Accountants.

Mr. Bennett has served as a fiscal forecaster in the accounting division since joining the company in 1957. He holds a master's degree in accounting from Long Island University.

Mr. Dammann joined Chemagro in 1957 in an administrative capacity, and in 1958 was named supervisor of plant personnel and services. He will continue in this position in addition to his new duties as secretary of the corporation. Mr. Dammann holds an LL.B. degree from Kansas City University.

NINE-MONTH REPORT

NIAGARA FALLS, N.Y.—Hooker Chemical Corp., Niagara Falls, reported, in its nine months and three months comparative statement of consolidated income, an increase of 31% in net income and 23% in net sales for the nine months ended Aug. 31, 1959, compared with the same period in 1958. Comparison of the respective third quarters, which ended Aug. 31, shows an increase of 25% in net income and 21% in sales.

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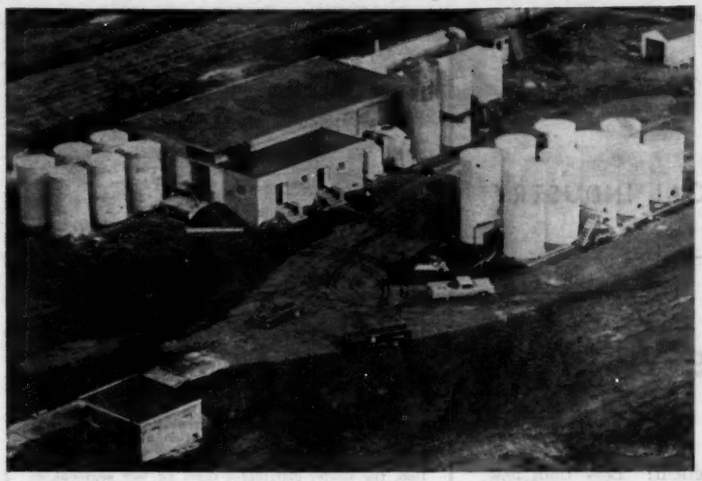

OPEN PLANT—Ris-Van, Inc., opened its newest liquid fertilizer plant, shown here, at Sanborn, Iowa, recently. This was the fourth such plant to be opened by the company in the last five years.

Ris-Van, Inc., Opens Fourth Liquid Plant With Parade, Speeches, Refreshments

SANBORN, IOWA — More than 1,000 visitors took part in the gala festivities which signaled the opening of a $150,000 Ris-Van, Inc. liquid fertilizer plant here, Oct. 31.

A parade, food, refreshments, favors for the ladies and a sprinkling of speeches highlighted the affair.

Rep. Charles B. Hoeven (R., Iowa) was the featured speaker and Ris-Van officials also welcomed the crowd and voiced plans for the future.

This was the fourth Ris-Van plant to open in five years. The firm started with a pilot plant at Belmond, Iowa, in 1954, and then introduced other plants at West Union, Iowa and Blue Earth, Minn.

According to Dr. John L. Strauss, Ris-Van research director, the Sanborn plant, with two 20-ton mixers producing a minimum of 1,000 tons daily, is the "largest liquid fertilizer plant in the world."

Other officials of the firm include Kenneth Van Duzer, president; Roy E. Carwell, comptroller, and Melvin E. Hawke, sales manager. All maintain offices at the company's headquarters in Belmond.

Ris-Van distributes exclusively through dealers, according to L. T. Trafford, public relations director. "We have a dealer organization of about 250 members. For the most part, these dealers are in an elevator or mill setup. We try to be quite selective with our dealers, and one of the first requirements is that he be a good businessman."

Company officials lauded the support and efforts of Sanborn's 1,300 townspeople. "They worked very hard initially when we were looking for a location and had some trouble acquiring the property from the railroad, and they certainly did themselves proud in helping make the event today a success," Mr. Trafford said.

The local high school band, complete with baton twirlers and majorettes, more than 100 kiddies dressed in a great variety of Halloween costumes and hundreds of local citizens marched through the community's streets and up to the new plant where they serenaded and amused the visitors.

Housewives prepared and served the food, and bouquets and messages of good luck were in evidence from the rest of the town's businesses.

The plant will employ approximately 30 during the peak seasons, Mr. Trafford said.

NORTHWEST

(Continued from page 1)

Boys who participate are paid $1 for each soil sample taken.

The association reported that three scholarships were awarded this year. They went to John Thomas, Washington; Roscoe Williams, Idaho and Lee Hanson, Oregon.

Glen Holt, Portland, explained the Oregon fertilizer demonstration project. Dick South, chairman of the program committee, presided at the noon luncheon.

Sherman McGregor was in charge of the afternoon program. Speakers were Rany Keim, Salt Lake City; Ralph Meeder, Los Angeles and Robert Hale, San Francisco. A film "Cash in on Grass" was also presented.

Final convention session was held Friday with Sid Martin, Yakima, presiding. Speakers included Raoul Allstetter, National Plant Food Institute, Washington, D.C. and Stewart Turner, consulting agricologist, San Francisco.

Featured action of the closing day's activities was the election of Karl Baur, manager, fertilizer department, Pacific Cooperatives, Portland, Ore., to the office of president.

Harold Rud, J. R. Simplot Co., Salem, Ore., was elected to the office of vice president while Henning Waltersdorph, Magnolia Fertilizer Co., Seattle, Wash., was reelected treasurer. Leon Jackson, Portland, Ore., was continued in the office of secretary.

Six Martin, Yakima Spray Chemical Co., Yakima, was named to head a special committee appointed to revise the constitution and by-laws for the purpose of the possible inclusion of liquid fertilizer distributors in the association.

The board of directors appropriated $1,000 for an Oregon farm project, which will include on-the-farm experimental plots in five different Oregon counties with 10 plots on each farm. This project was approved by the Soil Improvement Committee of the association, with Glen Holt, a committee member, directing the project.

The board of directors, on the recommendation of its scholarship committee, increased scholarships to Oregon State College, the University of Idaho and Washington State University, from $100 to $250 each.

Sales Rise Noted

LOS ANGELES—Sales of American Potash & Chemical Corp. for the nine months ended Sept. 30, 1959, totaled $41,242,331 compared with $35,619,683 for the corresponding period of 1958, Peter Colefax, president, announced on Oct. 26. Net income for the first three quarters of 1959 amounted to $3,805,555 compared with $3,155 395 for the like period of last year. After deducting preferred dividend requirements, earnings were $1.60 per share on the 2,273,204 shares of common stock outstanding, as against $1.32 per share earned in the first nine months of 1958 on the 2,270,802 shares then outstanding.

Agrico Adds Member To Agronomic Division

NEW YORK—William B. Tavener has joined the agronomic service division of the American Agricultural Chemical Co. as turf and garden agronomist. Dr. D. P. Satchell, Agrico's director of agronomic services, made the announcement.

Mr. Tavener will direct field service activities for Agrico's turf and garden department, in conjunction with fertilizer sales and service personnel in the field. He will headquarter in the company's New York office.

Mr. Tavener received a B.S. degree in hortieulture from Colorado State University in 1955, and a M.S. degree in ornamental horticulture from the University of California at Los Angeles in 1957. He then spent two years as assistant to the post agronomist at Ft. Carson, Colo., while in the Army.

Calspray Moves Midwest Office to Des Moines

RICHMOND, CAL. — The relocation of California Spray-Chemical Corp.'s Middle West headquarters from Maryland Heights, Mo., to Des Moines, Iowa, was recently put into effect. All management personnel, as well as many accounting and clerical staff members, have now moved into the newly constructed quarters in Des Moines.

Calspray personnel involved in the move include: R. C. Yapp, district manager; E. F. Connally, Jr., assistant to the district manager; R. M. Staples, branch manager, merchandising; Dr. R. H. Cummings, field research specialist, and A. W. Houston, district office manager.

Belgian Firms Sign Process Agreements

LIEGE, BELGIUM—The Imperial Chemical Industries Ltd. (I.C.I.) and Société Belge de l'Azote et des Produits Chimiques du Marly (S.B.A.), Liege (Belgium) recently concluded an agreement, according to which S.B.A. grants to I.C.I. the license of its process for ammonium nitrate granulation, the two firms have announced.

This process is applied by S.B.A. in its own plants and it is also used in many other units erected abroad by the S.B.A. engineering division for various chemical companies.

Branch Manager Named

RICHMOND, CAL.—The appointment of William B. Saylor, Jr. to the position of branch manager, merchandising sales, for California Spray-Chemical Corp. was recently announced by C. E. Cody, Calspray's regional manager, marketing—west.

In his new position, Mr. Saylor will be responsible for all garden and home sales in northern California, Nevada and Hawaii. With the company for the past eight years, Mr. Saylor was most recently a merchandising sales representative.

FERTILIZER BULLETIN

UNIVERSITY PARK, N.M. — Effects of fertilization on irrigated pastures are described in a bulletin issued by the Experiment Station of New Mexico State University. Data presented attempt to determine the effects of nitrogen and phosphorus fertilization on the yield, botanical and chemical composition of a Ladino clover-Alta fescue pasture mixture. The bulletin states that knowledge of the interrelations of these factors is necessary to make proper fertilizer recommendations.

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The regional circulation of this issue is concentrated in the Midwestern states.

No Use Trying . . .

Marketable Apple Crop Impossible Without Applications of Pesticides, Tests Show

AMONG THE VOICES contributing to the general tumult and shouting against the use of pesticides, are many loud ones saying that if we'd only leave the pests alone, nature would take care of the situation nicely. The "good" bugs would destroy the "bad" ones, perhaps in the same manner that the virtuous straight-shooting cowboy in TV westerns always manages to win no matter how badly the cards are stacked against him.

However, in actual practice it doesn't seem to work that way. Experiments have been made over wide areas to see just what does happen when all controls are withdrawn. In some such tests, apple orchards have been left to fight off the pests as well as they could, with their limbs tied behind them, so to speak.

In a recent paper presented before the Entomological Society of America, D. W. Hamilton, entomology research division of the U.S. Department of Agriculture, tells about such tests and the results therefrom. With the cooperation of a number of entomologists in various parts of the country, Dr. Hamilton was able to come up with some classic figures on apple losses in the absence of insecticides.

"Undoubtedly there have been wormy apples ever since Eve first tasted the fruit," he observed. "In the United States insect injury to apples has been a problem since the time of the early settlers. Indian drawings on the walls of caves show that injury by the plum curculio was one of the factors that determined whether or not adequate supplies of haws and berries would be available for their winter food."

Dr. Hamilton explained that his survey was made to form the basis of estimates on how much of a loss would be incurred by the apple crop in the absence of control measures and to indicate the cost of such measures and their effectiveness. In the first place, he said, one must consider the question whether or not apples can be grown successfully without a control program. There are many who say it is possible.

Yet, here are some typical comments received by Dr. Hamilton from entomologists contributing to the survey:

Philip Garman, Connecticut: "Less than 5% commercially useable fruit where no insecticides are applied, due to plum curculio and apple maggot."

E. H. Glass, New York: "Fifty to 99% of the fruit destroyed annually by insects where no insecticides were used on trees that received the regular fertilizers and fungicides; codling moth the most injurious insect."

W. S. Hough, Virginia: "Seventy to 80% of the crop would be lost if no insecticides were applied. This would mean a loss of $14 to $19 million to Virginia annually."

Y. W. Boulanger, Maine: "Apple maggot causes 98 to 99% loss in unsprayed orchards."

Earl R. Oatman, Wisconsin: "Fruit in neglected or unsprayed orchards is a total loss, primarily because of apple maggot and plum curculio."

J. Marshall and C. V. G. Morgan, British Columbia, Canada, reported as follows on an orchard planted at Summerland in 1946 where no insecticides have been applied: "Even in seasons decidedly unfavorable for the development of the codling moth, that insect has virtually destroyed the apple crop and the white apple leafhopper has invariably caused a great deal of damage to apple foliage."

W. R. Enns, Missouri: "Losses due to insects in unsprayed orchards are more than 50% on summer varieties and 100% on fall and winter varieties."

Studies in two unsprayed orchards near Vincennes, Ind., during 1953 show further the insect losses that can be expected when control measures are not applied. In one orchard, unsprayed since about 1936, 87.5% of the crop was injured:

69% by the plum curculio
18% by codling moth
6.5% by the rosy apple aphid
2% by the red-banded leaf roller
0.5% by the San Jose scale

The other block consisted of six remaining trees in an orchard that received a complete spray

(Continued on next page)

Table 1. Estimated insect losses to apples in the principal apple growing areas of the United States, 1958.

State	Thousand bushels produced	Spray applications	Cost per bushel for insect control			Total probable cost per state for all apples grown	Apples injured by insects in sprayed orchards	Estimated value of apples lost by insect injury	Estimated loss by insects plus control cost
			Materials	Application	Total				
	Number	Number	Dollars	Dollars	Dollars	Dollars	Percent	Dollars	Dollars
Maine	1,250	11-12	.09	.16	.25	312,500	2	37,500	350,000
Vermont	570	10-12	.25	.10	.35	199,500	7	40,000	239,500
Massachusetts	2,850	10	.10	.20	.30	855,000	5	150,000	1,005,000
Rhode Island	190	15-16	.20	.12	.32	60,800	18	35,000	95,800
Connecticut	1,490	10-15	.17	.15	.32	476,800	5	150,000	626,800
New York	15,600	8	.104	.065	.169	2,636,400	11	1,716,000	4,352,400
New Jersey	3,100	8	.40	.45	.85	2,945,000	5	150,000	3,095,000
Maryland	1,070	--	.11	.03	.14	149,800	5	62,500	212,300
Pennsylvania	6,100	9	.12	.04	.16	976,000	7	500,000	1,476,000
Virginia	8,100	8-9	.125	.035	.16	1,296,000	5	1,000,000	2,296,000
West Virginia	5,000	8	.19	.08	.27	1,350,000	10	312,500	1,662,500
North Carolina	1,400	7	.08	.16	.24	336,000	5	70,000	406,000
Tennessee	420	15	.13	.02	.15	63,000	3	14,544	77,544
Kentucky	188	12	.162	.12	.282	53,016	15	28,200	81,216
Ohio	4,000	8-10	.18	.10	.28	1,120,000	4	160,000	1,280,000
Indiana south	805	11	.1925	.10	.29	233,450	6	48,300	281,750
north	805	7	.11	.08	.19	152,950	3	24,150	177,100
Illinois	2,500	12	.31	.31	.62	1,550,000	2	192,000	1,742,000
Michigan	11,600	10	.14	.149	.289	3,352,400	2	232,000	3,584,400
Wisconsin	1,100	10	.06	.012	.072	792,000	7	154,000	946,000
Missouri	780	13	.15	.13	.28	218,400	10	78,000	296,400
Kansas	150	10	.26	.11	.37	55,500	4	50,000	105,500
Arkansas	48	9	.145	.075	.22	10,560	15	96,000	106,560
Colorado	3,312	(Cost $12/acre. Bu./acre not given)				191,640	10	65,332	256,972
New Mexico	2,000	2	.0266	.0133	.04	80,000	40	600,000	680,000
Utah	330	5-6	.28	.44	.72	237,600	40	290,000	527,600
Washington	32,600	4	.13	.06	.19	6,194,000	1	500,000	6,694,000
Oregon	3,100	4-6	.10	.024	.124	384,400	7	200,000	584,400
California	10,560	--	.12	.017	.137	1,446,720	1	132,000	
Other states 1/	3,760	--	---	---	---	863,496	-	220,712	1,578,720
Total	124,778	--	---	---	---	28,592,932	-	7,308,738	35,901,670

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Nov. 10-12 — Kansas Ammonia Service Schools; Nov. 10, Warren Hotel, Garden City; Nov. 11, Gibson Cafe, Osborne; Nov. 12, Holiday Inn, Topeka.

Nov. 12-13 — Oregon Weed Conference, YMCA Building, Medford, Ore.

Nov. 24 — Fertilizer Short Course, Capital Grange Hall, Dover, Del.

Dec. 1 - 2 — Illinois anhydrous ammonia Assn. Meeting, Law Hall, University of Illinois, Urbana, Ill.

1960

Jan. 6-7 — Wisconsin Pesticide Conference with Industry, Wisconsin Center Bldg., University of Wisconsin, Madison, Wis.

Jan. 27-28 — Annual Illinois Custom Spray Operators' Training School, University of Illinois, Urbana, Ill.

Feb. 9-11—Seventh Annual Agricultural Chemicals Conference, Texas Technological College, Lubbock, Texas.

Feb. 12—California Ammonia Meeting, Hacienda Hotel, Fresno, Cal.

Feb. 17-18, 23-25—Indiana Ammonia Service School; Feb. 17, Lafayette; Feb. 18, Bedford; Feb. 23, Valparaiso; Feb. 24, Ft. Wayne; Feb. 25, Muncie.

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Feb. 17-18—Pest Control Conference, Alabama Polytechnic Institute campus, Auburn, Ala. Sponsored by A.P.I. and the Alabama Association for Control of Economic Pests.

Meeting Memos listed above are being listed in this department this week for the first time.

Nov. 9-11 — California Fertilizer Assn., 36th annual convention, Fairmont Hotel, San Francisco.

Nov. 12-13 — Southwest Fertilizer Safety School, Tropicana Motor Hotel, Pasadena, Texas.

Nov. 15-19—American Society of Agronomy, Cincinnati, Ohio.

Nov. 16-20 — National Aviation Trades Assn., 20th annual convention, New Orleans, La.

Nov. 17-18-20 — Dealer-Sales Meetings, sponsored by the Rocky Mountain Plant Food Assn., Nov. 17, Greeley, Colo.; Nov. 18, Pueblo, Colo., and Nov. 20, Grand Junction, Colo.

Nov. 19—General Livestocks - Crops Field Day, University of Arizona, Yuma, Ariz.

Nov. 17-20 — Packaging Machinery Manufacturers Institute Show of 1959, The Coliseum, New York City.

Nov. 24—Rutgers' Pesticide Dealers Conference, College of Agriculture Campus, Nichol Ave., New Brunswick, N.J.

Nov. 24—Ninth Semi-Annual Meeting and Midyear Conference, Manufacturing Chemists' Assn., Statler Hilton Hotel, New York.

Nov. 30-Dec. 4—27th Exposition of Chemical Industries, New York Coliseum, New York City.

Nov. 30-Dec. 5—Joint meeting, Entomological Society of Ontario; Entomological Society of Canada and Entomological Society of America, Hotel Sheraton-Cadillac, Detroit, Mich.

Dec. 1-2—Annual meeting, Carolinas-Virginia Pesticide Formulators Assn., Carolina Hotel, Pinehurst, N.C.

Dec. 2-3—Indiana Fertilizer Conference, Memorial Center, Purdue University, Lafayette, Ind.

Dec. 2-3—Annual Missouri Fertilizer Conference, Columbia, Mo.

Dec. 7-10—Central Canada and North Central Weed Control Conferences, Royal Alexandra Hotel, Winnipeg, Manitoba, Can.

Dec. 7-8—Minnesota Soil Short Course, University of Minnesota Institute of Agriculture, St. Paul, Minn.

Dec. 7-11 — Nebraska Fertilizer Institute anhydrous ammonia workshops, Dec. 7, Lincoln, Neb.; Dec. 8, Hastings, Neb.; Dec. 9, Ogallala, Neb.; Dec. 10. Kearney, Neb.; Dec. 11, Columbus, Neb., Agricultural Ammonia Institute cooperating.

Dec. 8—Minnesota Fertilizer Industry Assn. meeting, University of Minnesota Institute of Agriculture, St. Paul, Minn.

Dec. 8-10—District Fertilizer Dealers and Lime Producers Schools, Dec. 8, Green Bay, Wis., Beaumont Hotel; Dec. 9, Eau Claire, Wis., Eau Claire Hotel, and Dec. 10, Madison, Wis., Wisconsin Center Building, sponsored by the Soils Department, College of Agriculture, University of Wisconsin.

Dec. 9-11—International Crop Protection and Pest Control Exhibition, Seymour Hall, St. Marylebone, London, England.

Dec. 10—Iowa Fertilizer Promotion Workshop, Savery Hotel, Des Moines, Iowa.

Dec. 10-11—Michigan State University Fertilizer Conference, Kellogg Center, East Lansing, Mich.

Dec. 10-11—Arkansas Plant Food Conference, Lafayette Hotel, Little Rock, Ark.

Dec. 11—Ohio Fertilizer and Lime Conference, conference theatre, Ohio Union, Ohio State University, Columbus, Ohio.

1960

Jan. 5-6—Annual Texas Fertilizer Conference, College Station, Texas.

Jan. 6-8—14th Annual Meeting, Northeastern Weed Control Conference, Hotel New Yorker, New York City.

Jan. 12-13 — Nebraska Fertilizer Institute annual convention, Pershing Auditorium, Lincoln, Neb.

Jan. 13-14—Pesticide School, North Carolina State College, Raleigh, N.C.

Jan. 13-15—Ninth Annual Convention, Agricultural Ammonia Institute, Statler Hilton Hotel, Dallas, Texas.

Jan. 14-16—10th Annual Convention of the Agricultural Aircraft Assn., El Mirador Hotel, Palm Springs, Cal.

Jan. 20-21—North West Agricultural Chemicals Industry Conference, Benson Hotel, Portland, Ore., C. O. Barnard, executive secretary.

Jan. 20-22—Thirteenth Annual Southern Weed Conference, Buena Vista Hotel, Biloxi, Miss.

Jan. 21—Northeast Region, National Plant Food Institute fertilizer sales promotion workshop, Hotel Hershey, Hershey, Pa.

Jan. 25—Wisconsin Lime and Fertilizer Day, University of Wisconsin campus, Madison, Wis.

Jan. 25-26—Second Annual Agricultural Pesticide Conference, Purdue University, Lafayette, Ind.

Jan. 25-27—Cotton States Branch, Entomological Society of America, DeSoto Hotel, Savannah, Ga.

Jan. 26-27—South Dakota Fertilizer Dealers Short Course, South Dakota State College, Brookings, S.D.

Jan. 27-29—Symposium on Chemistry of Phosphate-Soil Reactions, Muscle Shoals, Ala.

Jan. 28-29—Annual meeting of the Colorado Agricultural Chemicals Assn., Cosmopolitan Hotel, Denver, Colo.

Feb. 2-4—Pest Control Operators' School, North Carolina State College, Raleigh, N.C.

Feb. 8-9—Southwestern Branch, Entomological Society of America, Hilton Hotel, El Paso, Texas.

Feb. 11-12 — Midwest Agronomists-Fertilizer Industry meeting, Edgewater Beach Hotel, Chicago, Ill.

Feb. 22-25—Weed Society of America meeting, in conjunction with Western Weed Conference, Cosmopolitan Hotel, Denver, Colo.

March 23-25—North Central Branch, Entomological Society of America, Schroeder Hotel, Milwaukee, Wis.

June 13-18—National Plant Food Institute annual meeting, Greenbrier Hotel, White Sulphur Springs, W. Va.

June 27-29—Pacific Branch, Entomological Society of America, Davenport Hotel, Spokane, Wash.

July 13-15—Eleventh Annual Fertilizer Conference of the Pacific Northwest, Hotel Utah, Salt Lake City; B. R. Bertramson, State College of Washington, Pullman, Wash., chairman.

July 27-29—Great Plains Agricultural Council, 1960 meeting, Laramie, Wyo.

EDITORIAL

(Continued from page 22)

schedule through 1952. Ninety-eight percent of the crop was injured by insects:

88.2% by the plum curculio
84.9% by the codling moth
1.7% by the red-banded leaf roller
0.8% by the rosy apple aphid
0.1% by Forbes scale

These data indicate that apples cannot be grown commercially in the Vincennes area without resort to an insect-control program. They also indicate that the importance of the injurious species in orchards left unsprayed for several years may differ from that in orchards unsprayed for only a short time. This difference is attributed to the effect of natural enemies, many of which are killed in orchards where sprays are applied regularly.

This, of course, poses the question, "Can our insect losses be held to a low level by the action of beneficial species?" Several experiments have been conducted to answer this question. In 1935 the Idaho Agricultural Experiment Station at Parma set up a long-term experiment in a 5-acre orchard in which parasites of the codling moth and San Jose scale were liberated and sprays were not applied. Recovery studies in 1936 indicated that the liberated species had become well established but in 1938 practically all the fruit was wormy and only a light crop was gathered.

A similar experiment was started at Kearneysville, W.Va., in 1935 and maintained through 1942 by the West Virginia Agricultural Experiment Station and the USDA. No sprays were applied after petal fall. Crop yields in the block dropped each year, from 6,593 bu. in 1936 to 2,538 bu. in 1942, and codling moth injury during the 7 years ranged between 55 and 84%. The highest injury occurred in 1942.

From this information it is evident that few saleable apples can be grown without spraying. Thus, in the absence of control efforts the annual insect loss for the country would approach the value of the apple crop. To be conservative, at $1 a bu. this would be about $125,000,000.

A study of apple losses due to insects must include the cost of control plus the depreciation in the value of the crop even though control measures are applied. Estimates of these costs are shown by states in the accompanying table. Although many of these figures are "guesstimates," the fact that different individuals, working in neighboring states, reported similar cost figures indicates that they are reliable.

The codling moth was reported as the most injurious species nationally. However, in Maine, Connecticut, and Wisconsin, the apple maggot was reported as more injurious than the codling moth and in Pennsylvania, the plum curculio was so considered. In all states east of Nebraska, the plum curculio required annual control measures to prevent serious injury. Other insects reported as causing severe losses were orchard mites, the red-banded leaf-roller, and the rosy apple aphid. In one state scale insects and in another cutworms were included as important pests.

One loss that could not be readily determined was the dollar value of apples that are left unsprayed each year, since information on such acreage is hard to secure. One estimate, by G. F. Turnipseed of North Carolina indicated an annual loss of $577,500 in that state, and C. E. Cutright in Ohio estimated that state's losses as $1,462,500.

For the entire United States, an estimate of $35,000,000 would seem fair in tallying the annual loss, Dr. Hamilton concludes.

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